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CONTENTS

	PAGE
Editorials	405
Letters to the Editor	410
Publications Received	411
The Scrap Heap	412
Overseas Railway Affairs	413
German Turbine Locomotive Practice	416
New Machine for Axlebox Work	419
The Bugatti Railcars and their Services	420
Sperry Rail Detector, Canadian Pacific Railway	422
A new American Locomotive Type	423
Self-Printing Ticket Machines	424
New Facilities for Ocean Passengers at Plymouth Docks	426
Railway News Section	427
Personal	427
News Articles	429
Notes and News	432
Contracts and Tenders	434
Legal and Official Notices	435
Railway Share Market	436

What is a Burden?

SIR JOSIAH STAMP deserves the gratitude of the man in the street for drawing attention, in his presidential address to the British Association, to "The Impact of Science on Society." The situation is urgent, but, as Sir Josiah says, we usually call problems "academic until we are going down for the third time." At Blackpool the flower of British learning is now assembled, pouring forth torrents of words as if the world of men and women consisted of mere symbols rather than facts—human facts that have human reactions. Every effort of science is bent towards industrial efficiency, towards maximum production at a minimum of human effort. The result, Sir Josiah Stamp calls it the "impact of science," he regards as a "burden" in that every increase in efficiency tends to release human beings from the necessity to labour, by making possible greater output *per capita*. The scientist nevertheless goes on and on, regardless of the end, regardless of the fact that he is not steering—that no one is steering—that no one thinks of the objective. Thus the scientist and the engineer, by whose ingenuity this abundant production has been made possible, blindly continue to increase it, every advance they make normally "throwing men out of work." If Sir Josiah Stamp's address stirs up a sense of responsibility in the scientists and the engineers he will have served his generation well.

Profitable Lower Standard Fares

Penny-a-mile rail travel sounds, and is, a good bargain, and the conditions upon which it is offered are so well known that it is but rarely a complaint is heard over the fact that holders of single tickets do not profit by it. Long familiarity with cheap fares as the prerogative of those making return journeys has tended to kill the habit of one-way travel by train, particularly as the number and variety of cheap returns increases, while the single ticket—practically the sole survival of the standard fare—remains unaltered in price. The question therefore arises whether our railways are not losing a considerable volume of what may be described as casual traffic. In America, where, from June 1 this year, the standard coach fare on the Eastern railways has been reduced to two cents a mile, increases ranging up to 78 per cent. in the number of passengers carried, and up to 24·6 per cent. in passenger revenue, are reported for July, as compared with the corresponding period of last year. There are some areas in this country where cheap single tickets are issued locally, and the extra numbers thereby attracted to the rail, coupled with the American experience, suggest successful results were such a facility to be standardised and made universal.

* * * *

The Week's Traffics

General satisfaction is expressed with the increases in the returns of the four group companies for the past week which together amount to £229,000 in comparison with £154,000 for the previous week. For the year to date the gross earnings of the four companies together are estimated at £108,054,000, an increase of £3,348,000, or 3·20 per cent. Passenger train traffics of the L.M.S.R. for the 36 weeks show an increase of £295,000, or 1·64 per cent., of the L.N.E.R. £179,000, or 1·53 per cent., of the Great Western £73,000, or 0·95 per cent., and of the Southern £128,000, or 1·14 per cent. On the L.M.S.R. the increase in merchandise is £949,000, or 5·95 per cent., on the L.N.E.R. £449,000, or 4·07 per cent., and on the Great Western £283,000, or 4·39 per cent. Coal traffics on the L.M.S.R. to date show an advance of £424,000, or 5·21 per cent., and on the L.N.E.R. £416,000, or 5·30 per cent.

	36th Week			Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.
L.M.S.R.	+	39,000	+ 25,000	- 3,000 + 61,000	+ 1,668,000 + 3·96
L.N.E.R.	+	45,000	+ 36,000	+ 13,000 + 94,000	+ 1,044,000 + 3·41
G.W.R.	+	16,000	+ 13,000	+ 4,000 + 33,000	+ 424,000 + 2·41
S.R.	+	24,000	+ 10,000	+ 7,003 + 41,000	+ 212,000 + 1·47

The Belfast & County Down has an increase for the year to date of £2,545, the Great Northern (Ireland) one of £22,850, and the Great Southern one of £123,442.

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Port of London Authority

An increase of business under most headings is shown in the recently-issued report of the Port of London Authority for the year ended March 31, 1936, in comparison with the previous year. Net register tonnage of vessels arriving and departing with cargoes and in ballast coastwise and from and to overseas rose from 58,947,642 tons to 59,762,150 tons, and the total tonnage of imported and exported goods (foreign, coastwise and transhipments) increased by 4·1 per cent. Imports from overseas, amounting to 17,110,486 tons, showed an advance of 2·2 per cent., and the overseas exports of 3,377,930 tons were 11·7 per cent. higher. There was an increase of 4 per cent. in the net register tonnage (43,994,717) of vessels paying river dues of tonnage, and of 3·6 per cent. in the tonnage (25,664,025) of shipping using the

wet docks, but the shipping entering the dry docks fell from 3,113,119 tons to 3,104,195 tons. Import goods landed at the docks for warehousing or immediate delivery amounted to 2,163,239 tons, a decrease of 52,629 tons or 2·4 per cent., but there was a rise of 62,494 tons in the export traffic of 677,995 tons handled on the dock quays. Total revenue advanced from £5,448,391 to £5,668,279, total expenditure from £3,958,340 to £4,082,354, and the balance of revenue from £1,490,051 to £1,585,925. Interest and sinking fund charges, less interest receivable, amounted to £1,579,759, leaving a surplus of £6,166, compared with £3,730 for the previous year.

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Overseas Railway Traffics

Central Argentine gross earnings again make the best appearance amongst Argentine railways, with an increase of £69,253 during the past fortnight. On the Cordoba Central the increase during the two weeks has been £8,980, and the Buenos Ayres & Pacific has reduced its decrease during the same period by £7,163. The Buenos Ayres Great Southern and the Buenos Ayres Western have, on the other hand, added £15,858 and £5,228, respectively, to their former decreases. It is satisfactory to note that the Great Western of Brazil at the end of the 36th week of the current year has now an increase of £1,100 in sterling, representing an advance of 2,284 contos in currency. For the same period the Leopoldina records an increase of £58,395, or 7,020,000 milreis. The San Paulo for the 35 weeks shows a gain of £207,338.

	No. of Weekly Week Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
Buenos Ayres & Pacific	10th	7,4309	+ 3,140	714,163 - 5,042
Buenos Ayres Great Southern	10th	112,816	- 7,853	1,053,726 - 105,915
Buenos Ayres Western	10th	39,389	- 4,416	383,290 - 20,044
Central Argentine	10th	145,397	+ 39,167	1,286,074 + 110,324
Canadian Pacific	35th	922,200	+ 148,600	17,126,20 + 1,407,200
Bombay, Baroda & Central India	22nd	193,500	+ 19,500	3,472,800 + 235,050

Canadian Pacific gross earnings for the first seven months of 1936 amounted to £14,724,200, an increase of £1,192,600, but in the net earnings of £1,554,000 there was an improvement of only £36,400. There was a heavy increase in expenses in the month of July.

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Trinidad Government Railways

The system of railways worked by the Trinidad Government consists of 124 route miles of running lines on the 4 ft. 8½ in. gauge, of which 6½ miles are double track, and a steamer service is under the same administration. From the recently-issued report for the year 1935 it appears that for the first time since 1929 passenger and parcels receipts showed an increase. Goods traffic tonnage improved by 14 per cent. and receipts by 8·42 per cent. in comparison with 1934. There was a large increase in the tonnage of canes hauled to factories at ton-mile rates of less than 3 cents. The Trinidad dollar = the U.S. dollar.

		1935	1934
Passengers	...	1,183,169	1,188,555
Tons	...	422,960	370,251
Train miles	...	405,008	396,130
Operating ratio, per cent.	...	112·91	115·17
		\$	\$
Passenger receipts	...	125,008	123,365
Goods traffic receipts	...	407,040	375,429
Gross earnings	...	592,312	557,808
Working expenditure	...	669,813	642,446
Net deficit	...	77,500	84,638

On the steamer service there was a net deficit of \$5,824 in 1935 as compared with \$8,785 in 1934. The increase in railway expenditure was mainly in the locomotive branch. Information as to the suitability of diesel locomotives is being obtained.

A French View of the L.M.S.R. Quota

It is not surprising that the L.M.S.R. Quota scheme has attracted attention on the Continent, where the sporting proclivities of the Englishman are often the subject of kindly but searching analysis; hence the space devoted by a French review—the *Mercure de France*—to the infiltration of *le sport anglais* into the commercial field. The article in question quotes at some length from the exposition of Quota principles in our issue of March 29 of last year, and the author also acknowledges his indebtedness to the L.M.S.R. for reports and documents placed at his disposal. To the French taxpayer, who helps to make good out of his own pocket the recurring railway deficits, the L.M.S.R. is held up as an example of what can be accomplished by a company free to develop its services unfettered by obstructive legislation. The feature of the L.M.S.R. scheme which seems to impress the writer most is not as much the keenness among the staff engendered by the competitive element, as the close contact established with the public by the various branches of the commercial organisation. Inspired thereby, the writer asks for better travel propaganda from the French National Tourist Office and the various local organisations, while the railways are urged to form a common department for advertising and improvement of facilities.

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Abandonment of the "Oversea" Railway to Key West

Since September of last year, when a violent storm seriously damaged 40 miles of the Florida East Coast "oversea" line, no service has been worked to Key West, and, abandonment of the railway has been generally expected. As we mentioned briefly last week, application has now been made to the Interstate Commerce Commission for a certificate authorising the railway company's receivers to abandon the 125 miles from Florida City to Key West and to take up the tracks. The line, which was begun in 1905 and opened in January, 1912, made use of a chain of "keys" or islets to link the mainland with Key West in the Gulf of Mexico. It was built to afford a southern terminus with port facilities for shipping on the Gulf and to the West Indies, but there has been a rapid decline in the traffic since the peak was reached in 1927, and in 1934 the revenue was only 25 per cent. of what it had been in 1927 and 1928. Following the storm of a year ago arrangements were made for a freight service through Port Everglades by car ferry to Cuba; the passenger service has since been handled by the Pensinsular & Occidental Steamship Company's Miami-Havana route. This is said to be as satisfactory as the former service via Key West and there are no indications that any substantial increase in the volume of through or domestic freight over that handled in recent years would result, even if the large expenditure necessary to repair the damage were incurred. It is expected that the right of way will be bought for use as a toll highway.

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The Manifold Valley Bridges

It is the habit of some to bemoan what they themselves have done little to prevent. When two years ago, owing to there being an annual loss of £3,500 on the working of the line, the L.M.S.R. felt obliged to close the 2 ft. 6 in. gauge Manifold Valley Light Railway, there were many protests from local bodies that had done little or nothing to help to direct traffic towards the line. Now that the railway company is considering taking the further step of dismantling the track and the 22 bridges, which carry the line over the tortuous courses of the Rivers

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Hamps and Manifold, a fresh local agitation has been raised. It is pointed out quite correctly that if the railway bridges are removed the public will be deprived of what is at present the only convenient means of access to the valley from the southern end, there being no road or footpath. The minor chasms which these bridges span are usually the courses of torrential streams, although as the photograph we reproduce on page 428 shows, there are seasons when the river bed is left parched and sun-baked. Apparently the Staffordshire County Council is loath to take any action such as buying the track and converting it into a road. The L.M.S.R., on the other hand, is anxious to give sympathetic consideration to local feeling. Surely it is a little unreasonable, however, that the railway company should be expected to bear the burden of maintaining the line solely for the pleasure and convenience of those who failed to patronise the railway when a train service was provided.

* * * *

A Building of Distinction

Last year a new wing to the Southern Railway Servants' Orphanage at Woking was opened by Mrs. Robert Holland Martin, wife of the Chairman of the Southern Railway. In a recent issue of our contemporary, *Building*, Mr. J. R. Leathart describes this new wing as "an example of current English building which achieves distinction by virtue of its soundness and unaffected simplicity." Mr. Leathart, who is well known for his comments on current architecture, finds that "by a strict exercise of economy of means, a building of character has been produced. The friendliness of good brickwork is to be observed in the elevation, which relies for its effect on a well-adjusted relationship of solid and void, and on shapely proportion. Just sufficient centre-line accentuation is achieved by means of a wide entrance doorway, and by the lead and painted-wood clock turret, and the horizontal emphasis of the ground-floor storey by rusticated brick adroitly avoids any tendency towards monotony of surface treatment, which is apt to occur when brickwork of this particular style in design is unrelieved by stone dressings." An illustration of this orphanage extension of "pleasantly Georgian-flavoured design of charm and modesty" will be found on page 428.

* * * *

Has the Turbine Locomotive a Future?

Diversified opinions are held regarding the future of the steam turbine as a prime mover on railways, many of those qualified to speak asserting that it has no future at all. While dissenting from so extreme a view, we do not necessarily range ourselves alongside such convinced believers in the turbine locomotive as Herr Burmeister of Essen, whose article on the subject, originally published in the columns of our German contemporary *Gläser's Annalen*, appears on page 416. His optimism is backed by a thorough acquaintance with the course which turbine design has followed, and a shrewd opinion as to likely developments. He can see opportunities everywhere for the wider adoption of turbine-driven locomotives, although, for the moment, he confines his attention to the application of the principle to express passenger train service, which at present seems to be its most suitable field. Herr Burmeister's contentions and, indeed, some of the data upon which he bases his conclusions, occasionally appear exaggerated, and we ourselves consider that he does the reciprocating steam locomotive scant justice in the course of his deductions. Be that as it may, he has provided food for thought on a very important phase of railway

propulsion. The designs he puts forward include one for a high-speed locomotive having the 4-6-4 wheel arrangement and a special form of high pressure boiler with forced circulation, working at 560 lb. per sq. in. For this design he claims a continuous shaft h.p. of 3,400. The locomotive, he says, will consume about 12,700 b.t.u. per h.p. at the turbine shaft.

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Railcars of Large Capacity

Within the last few weeks the French State Railways have inaugurated a new era in railcar application by the acquisition of five railcar trains of exceptional power and capacity. Two of these are of the Michelin pneumatic-tyred type, one is a three-car Bugatti, and two are Renault trains with the high output of 1,000 b.h.p. All these sets are intended for normal operation at speeds up to 140 km.p.h. (87 m.p.h.), a speed which in France hitherto has been limited to the 400 and 800 b.h.p. Bugatti cars. In four of the five examples mechanical transmission is used, that of the two Renault trains being exceptional in that 500 b.h.p. is transmitted through a single gearbox. In the fifth train, the Bugatti, the maker's standard practice of direct drive is retained, and it presents no new problems, having been used with the same engine in the Bugatti single cars. As units for mass transportation—the seating capacity ranging up to 152—the development of these cars on the Etat may be traced to the successful performance of the two Renault 500 b.p.h. twin-articulated trains during the past two years, first on the fast Paris-Caen service, and for the past year between Rennes and Quimper. Certain French lines, e.g., the P.L.M., still appear to be keenly critical of railcar traction, although they have numerous cars in service and on order, but the Etat has tackled railcar operation in all its branches in a most workmanlike manner, with the result that orderly progress has characterised a rapid development.

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Something New in Shunting Locomotives

Locomotives for shunting service and similar work are usually built as tank engines—usually of relatively moderate proportions. In the United States, however, such engines mostly approximate to main line standards in size and weight, and often in their equipment as well. The latest additions in this category are the new locomotives, built by the Baldwin Locomotive Works to the order of the Union Railroad, which have the 0-10-2 wheel arrangement, weigh, including tender, 287½ tons in working order, and develop a tractive effort with booster of 108,050 lb. at starting. The reversible booster engine is incorporated in the front bogie truck of the tender. The boiler, which has a total combined heating surface of 6,197·2 sq. ft., carries a working pressure of 260 lb. per sq. in. It is capable of evaporating approximately 63,600 lb. of water an hour, and of affording a potential boiler h.p. of about 3,660. The name Union has been applied to the new type to commemorate that of the railway for which it was first built. Although the railway operates only about 45 miles of track, it is an important link in the vast network of railway lines which connect Cleveland and other ports on Lake Erie, with the steel district of Pittsburgh and the rest of the country. It serves thirty or more stations and sidings along its lines, collecting and distributing train-loads of ore, coal, limestone and mixed commodities. The railway desired to increase the tonnage hauled, and, at the same time, to eliminate assistant engine power, thus securing more economical operation. The new 0-10-2 type is the result of considerable study of this problem. It is illustrated and described on page 423.

Minor Amenities of Rail Travel

RAILWAY publicity has already made the general public fully cognisant of the more important passenger train arrangements, such as those associated with cheap travel, reservation of seats, luggage in advance, restaurant car and sleeping car arrangements, &c.; but the companies also provide a number of minor facilities which can add considerably to the convenience of rail travel. For example, the companies have established parking grounds at a number of stations where charges range from 6d. to 1s. a day, while season tickets can frequently be obtained at considerably lower rates. Similarly, bicycles may be stored under cover at many railway stations for a daily small charge, or at season ticket rates varying from 1s. 6d. a week to 11s. 3d. a quarter. For motorists who do not wish to take to the road until they are well clear of urban areas, cars accompanying passengers, other than to and from shows or exhibitions, are conveyed at a charge of 3d. a mile for the single journey or 4½d. a mile return, subject to the passenger travelling a minimum distance of 50 miles and purchasing one first class or two third class tickets between the same points and by the same route. Then from time to time travellers wish to send urgent messages en route, and it is now possible to obtain inland telegram forms from train ticket collectors and, in many cases, from restaurant car and sleeping car attendants, who will collect the appropriate charge and arrange for the despatch of the telegram at the next stopping point.

Most people who have to make night journeys are aware of the sleeping car facilities provided on the principal night trains, but those not wishing to take advantage of these can hire rugs or pillows from the platform staff or from the sleeping car attendants at a charge of one shilling. Upon arrival at destination, cloakroom facilities and frequently hairdressers' establishments are available on the station premises, while at certain terminal points baths and dressing accommodation is available. Restaurant and buffet cars are run on an ever-growing number of trains, but baskets containing breakfast, luncheon, tea or dinner can still be obtained from refreshment rooms at most important terminal stations, and also from many large stations en route, upon notice being given to the guard. Snack boxes containing sandwiches and other light refreshments are supplied at a very reasonable charge. Incidentally, glasses of drinking water are supplied free of charge to passengers at refreshment rooms, while dog lovers will be interested to know that water for their dogs may be obtained at any refreshment room, or upon application to the station platform staff.

It is frequently necessary for sick or infirm people to make journeys, and the railway companies have a deservedly high reputation in connection with the conveyance of invalids by rail. Where desired, a carriage specially adapted for the conveyance of invalids can be supplied upon payment of a minimum of four first class and four third class fares, while ambulances or private cars can frequently be driven on to station platforms to the door of the compartment in which the invalid is travelling. In other cases, accommodation is reserved in an ordinary compartment, if at all possible, and every effort made by the railway staff to facilitate the transfer to and from the train. In this connection mention may be made of a new type of stretcher introduced by the Great Western Railway, which can be accommodated on the seat of an ordinary compartment, thus enabling the patient to be conveyed by railway with the minimum of inconvenience. Invalids who desire to travel in bath chairs, invalid chairs, or similar vehicles, can be accommodated in guard's vans subject to certain conditions,

while wheeled invalid chairs are kept at the principal stations and may be used free of charge for the conveyance of patients to and from trains. In these and many other ways the companies are constantly endeavouring to improve the amenities of rail travel, and the steady increase in passenger traffic is indicative of the success which is attending their efforts.

The Model Railway Hobby

THE frequent inaccuracy or even misrepresentation contained in lay press comments on railway affairs, sometimes gives place, when the popular newspapers take notice of the model railway world, to a slightly patronising benevolence which is equally distasteful to those concerned. A writer in *The Model Railway News*, Mr. J. Ingarfill, has therefore inquired in what way the model railway enthusiast differs from devotees of other hobbies whose pursuits are less commonly described as "playing." We all know the stock headline "Grown Men Play at Trains," with its variants, which appears annually over accounts of model exhibitions, and we sympathise with Mr. Ingarfill when he complains that such implications of eccentricity seem to be specially reserved for the constructor and operator of model railways. For some reason, as he remarks, the art of the ship modeller appears to be held in much greater respect. Mr. Ingarfill very fairly observes that even model railway catalogues are not guiltless of nourishing the delusion that the hobby is primarily juvenile, and press photographers can therefore be excused for broadcasting pictures of elaborate railway models in the hands of schoolboy admirers. The catch phrase of publishers of railway books—"for boys of all ages"—is also mentioned as poor propaganda for the serious side of the model railway hobby. The railway does exercise its fascination upon all ages, but it is a lamentable delusion that those who succumb to it suffer a stunting of mental growth that causes them to go through life regarding it with the uncreative admiration of a small boy with his first box of trains.

Economical Rail Manufacture

THE iron and steel industry in Cumberland is of early origin, the working of Cumberland ores being traceable back to mediæval times. The development of the local industry was much stimulated by the evolution, in the late sixties of the nineteenth century, of the acid Bessemer steel-making process. This added greatly to the importance of the subsequent discovery of new large quantities of pure low phosphorus iron ores in the district. The presence of large areas of good coking coal afforded an additional advantage, and the local industry grew to considerable dimensions. Post-war conditions led to the formation of the United Steel Companies' Cumberland Group, which brought within one organisation iron ore mines, limestone quarries, coal mines, coke ovens, blast furnaces, and acid Bessemer steel works.

Cheap supplies of pure low phosphorus pig iron are essential to the success of the iron and steel industry in Cumberland, and so are low costs of blast furnace operation and raw materials. The United Steel Companies have steadily pursued economy and efficiency in the two last named directions. Their Derwent blast furnace plant at Workington has been mechanised, and a modern acid Bessemer plant has been put up in place of the old installation which operated continuously from 1872 until 1935. Now the companies have just brought into operation a modern by-product coking plant which, in addition to producing a high grade coke of uniform quality, recovers from the gas evolved in the ovens valuable by-products

in the form of tar, ammonium sulphate, motor fuel, toluole, and naphthalene, the sale of which contributes towards lower manufacturing costs of coke, which advantage passes on in the form of reduced costs of pig iron production, and ultimately of the steel rails for which Workington is famous. Incidentally, the Workington acid Bessemer plant is fully equipped for producing Sandberg sorbitically treated rails.

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Locomotive Building

IN May, 1934, an article was published in *The Nineteenth Century and After* dealing with the oft-recurring topic of whether it is better and cheaper for the railway companies to build locomotives and rolling stock themselves or to entrust the work to the contract firms. A suggestion put forward by the writer of the article, Mr. Ashley Brown, was that there should be an "independent company to furnish the railway with locomotives and rolling stock, enjoying an assured and steady demand resulting in economic production, and that the profits from such a company should be added to those made by the railways." The latter were to confine their operations to running and repairing the stock, and it was further proposed that experimental work should, in large degree, be centralised. In the August issue of *The Rail-owner*,* Lt-Col. E. Kitson Clark, whose long experience in the locomotive industry is well known, has some very pointed things to say about this. The idea of an independent constructional company would, he said, naturally have the effect of dispossessing the private locomotive builders of their basic market and it should be pointed out at once that to them as a group the success of the railways is no less indispensable than it is to the stockholders and, indeed, to the nation itself. In the previous article a statement, attributed in effect to the manufacturers, read, "Give us a steady stream of orders for the home market and we will keep up our flow of foreign orders," the assertion being then dismissed somewhat airily by a remark that the promise of increased export trade is more alluring than convincing.

Lt-Col. Kitson Clark joins issue with this at once. It is granted, he says, that export trade is more difficult than it was when Britain had the lead, but British-built locomotives have been sent all over the world during the last few years, a fact that proves that this trade, if difficult, is still a magnificent asset to the country, and if to the country then to the railways. May not the manufacturers reasonably assert that the more difficult the trade the more should they look for conditions which if satisfactory to the railways are, at the same time, of assistance to the manufacturers' position? The shops are here, and experience in the manufacture of every type of locomotive is available in plenty. When the regular use of a definite proportion of shop capacity can be relied upon, money can be spent with confidence on the progressive improvement of the machinery and methods, charges can be divided and the general enterprise extended to foreign markets, and when such contracts are added to the British order books by the help of the railways here there will be an increase in the demand for material at home and more employment of labour. Each of these attributes involves in geometrical progression a multiplication of railway traffic, so that the opportunity thus afforded will be twice blessed, giver and receiver alike deriving benefit.

The words "manufacture of every type of locomotive" point to an indispensable factor in the whole story. It may and indeed has been put forward, that a dozen dif-

ferent types of engine would be capable, by the mere process of multiplication, of hauling all the passenger and goods traffic in this country. The blessed word "standardisation" has had its votaries since Robert Stephenson's days and there was a firm which in the early days applied itself with enthusiasm to the practice. The policy, however, was found to be fraught with difficulties which divided the partners, and as a consequence the firm ceased to exist. A measure of standardisation limited to components has its undoubted advantages but the same principle applied wholesale in respect of locomotive types is another matter altogether. Competition is another big word and though its worship should have its limitations, as the manufacturers know full well, it is part of the stir of life. It is an insurance against the possibility of stagnation into which the proposed single independent company with extensive works might sink, having its activities infected by the merciless disregard of individual requirements. Grant then that differences must come and a large part of the argument for mass production seems to be weakened. The profits of the manufacturer are always brought into the argument, almost as an indictment of their existence, but might it not be replied, the author asks, that without profit trade itself could scarcely exist and without trade a railway's occupation is gone? Further, the argument itself is weakened in that the making of locomotives in an independent central establishment is expected to provide a margin on costs, and from that margin, or profit, the dividends of the stockholders should be reinforced.

A possible alternative to the proposed "single independent company" furnishing the railways with locomotives and rolling stock which Lt-Col. Kitson Clark so forcefully condemns would, we suggest, be the fusion of the respective interests of locomotive builders and the railways in the form of a company or companies somewhat on the lines of the railway road transport scale of activities. This would ensure a more definite and stabilised home market for the locomotive and rolling stock manufacturing co-operators and would react favourably on the latter in the matter of export trade. By allocating, as far as possible, certain designs and classes of engines to each of the works in turn, thereby, in effect, standardising to a large extent the pattern-making, foundry, and machine-shop methods, considerable economies arising from a more uniform output would, in all probability, be ensured. The author in conclusion states that the connection between the railways and the individual manufacturers is a long and honourable one, and it will hardly be considered derogatory by either party to admit that each has helped the other.

RAILWAY PAPERS AT BRITISH ASSOCIATION MEETING.—At the annual meeting of the British Association at Blackpool, papers are being delivered today by Mr. W. A. Stanier, Chief Mechanical Engineer, and Mr. Ashton Davies, Chief Commercial Manager, of the L.M.S.R., on "The Development and Testing of Locomotives," and "Holiday Travel to Blackpool and Its Problems for the L.M.S." respectively. On Tuesday, September 15, Mr. T. M. Herbert, Research Manager, L.M.S.R., will give an address on "The Transport of Food." We hope to deal with these papers next week.

Sir Josiah Stamp, in his presidential address (on which we comment editorially on page 405) referred to the share of railways in the "burden" of labour displacement resulting from "the impact of science on society," and suggested that the sort of public control exercised over railways through Parliament and public opinion might be extended to other industries.

* The organ of the British Railway Stockholders' Union Limited.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Right and Left Hand Running

London, September 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It may perhaps be useful to supplement the article on this subject in your issue of August 28 by some particulars showing how signalling has been influenced by the adoption of right or left hand running.

When the semaphore railway signal was introduced in this country by C. H. Gregory in 1841 it was the practice to mount an arm for each direction on one post, and the plan naturally followed was to make the arm projecting to the left as seen by the driver of an approaching train apply to that train, so making the two arms correspond with the manner in which the two tracks of a double line were used, especially if the post were imagined to stand between them. When single armed signals became necessary, as they soon did, they were placed on the left of the line, unless there were special reasons against it. This resulted in the semaphore arm projecting away from the

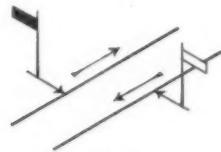


FIG. 1

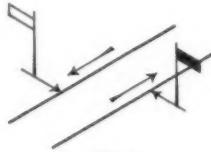


FIG. 2

track to which it referred (Fig. 1), although a person giving such a stop signal by hand would not stand with his back to the line, but would face it and extend his arm across the track. In countries where right hand running was adopted the same thing resulted but in the reverse form (Fig. 2), and these are the arrangements usually met with. There are, however, some interesting exceptions.

The Chicago & North Western Railway, as stated in your article, is operated left handed, but uses the standard American right handed semaphore which consequently projects across the track (Fig. 3). The same situation obtains in Switzerland, while in Finland and on the M.Z.A. in Spain, with right hand running, this position is reversed, as it is on the New York, New Haven & Hartford and some American interurban lines, where this is done with the object of making the semaphores more conspicuous among the overhead masts and fittings.

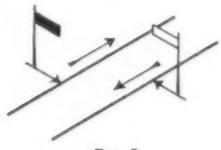


FIG. 3

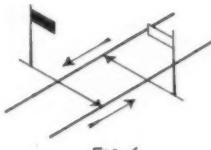


FIG. 4

A peculiar method of placing the signals, which does not appear to have been used anywhere else, was at one time followed on the State-owned, but company-worked, "S.S." lines in the Netherlands, as shown in Fig. 4. The running is right handed but the signals were all placed on the wrong side of the line, i.e. outside the other track. The reason is stated to have been that the locomotives, practically all obtained from Beyer, Peacock & Company, had left hand drive and this arrangement was considered to give the drivers a better view of the signals. No other railway, to my knowledge, has ever made it the rule to place its signals in this way, but there are some which place them on one side on single lines and the other on double, the Swiss and New Zealand lines among them. All signals in the Netherlands are now situated on the

right of the track. The increasing use of light signals tends to lessen interest in these differences of practice, and the use of electric traction, with an uninterrupted view ahead for the driver, has made the question of his position on the footplate of no further importance in some countries.

Yours, &c.,

T. S. LASCELLES

Are Our Critics Justified?

Colorado Springs, U.S.A.

August 30

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The passengers who were compelled to leap from a burning train at Micheldever on August 15 may at least be thankful that the fire occurred on a section of the Southern Railway which has not yet been electrified. If the only alternatives before them had been either to stay in the train and be burnt alive or to jump on to the track and be electrocuted by the live rail their fate would indeed have been hard.

I am spending the summer holiday revisiting western American lines on which I first travelled in Victorian days. One cannot help admiring the way in which the American companies have faced adversity: low fares; high speed—in some cases *very* high speed; air conditioning; and an excellent dining car service; have made railway travel attractive; and such is the standard of safety now reached that in 1935 not a single passenger was killed in a derailment or collision on any railway in the whole of the United States. And it is cheering to find that, in spite of the countless motorcars which one sees everywhere, the trains are well filled and doing a good business.

And then one thinks of railways at home: still charging war emergency fares except for certain return tickets; still content to have important expresses slower than they were a generation ago; still running freight trains without the protection of a continuous brake—hence the Shrivenham accident last winter and many similar accidents in recent years; still providing tepid drinking water (if any) in the dining cars; and still unanimously ignoring the French compound system for locomotives.

Yours, &c.,

W. B. THOMPSON

[Mr. Thompson's fear for passengers who might in an emergency have to descend from a train on to a line equipped with third rail electrification at 600 volts d.c. is, we think, unnecessarily great. It would be the easiest thing for the train staff to warn the passengers to keep clear of the third rail, even in the unlikely event of the passengers' common sense failing them. Even then contact with the 600 volt rail would not normally prove fatal and indeed unless the weather were wet or a passenger were in simultaneous contact with both running rail and third rail, even discomfort from shock would probably not be severe. We are glad to be able to give publicity to Mr. Thompson's tribute to American railways and would draw our readers' attention to the editorial note on page 405 referring to large increases in passengers following the introduction of low fares. While agreeing that there is some truth in Mr. Thompson's last paragraph, it is not by any means the whole truth, and diligent readers of THE RAILWAY GAZETTE may safely be left to form their own judgment.—ED. R.G.]

LINK WITH STEPHENSON'S "PUFFING BILLY."—The funeral at Jarrow on August 26 of Mr. Thomas Greenfield, aged 83, removed what is probably the last link connected with George Stephenson's famous engine *Puffing Billy*. This locomotive, which was used to draw coal from Killingworth colliery to Wallsend, is now preserved in Newcastle Station. Mr. Greenfield was the last man to drive the *Puffing Billy* before it was withdrawn from service.

PUBLICATIONS RECEIVED

National Public Works : Examination of Documentary Material Collected (League of Nations Publication VIII, Transit, 1936, No. 8). London : Allen & Unwin Limited, League of Nations Department, 40, Museum Street, W.C.1. 10½ in. x 8 in. 48 pp. Price 1s. 6d. net.—The material so far collected in the course of the League of Nations inquiry on national public works has now been examined and reported upon by a committee of experts, whose general conclusions are herein published. Most of the publication, however, consists of a summary of the situation as it stands in all countries which have so far replied to the League questionnaire, as prepared by the Secretariat. This is the material upon which the report of the experts has been based. It is in three sections, dealing respectively with administrative measures, methods of finance, and the allocation between materials and wages of expenditure involved by public works.

Playtime in Portugal. By John Gibbons. 1936, London : Methuen & Co. Ltd., 36, Essex Street, W.C.2. 6½ in. x 4½ in. 184 pp. Illustrated.—He who is led by the title of this book, and by its illustrated wrapper, to expect an account of luxury hotels, casinos, and bathing beaches, is likely to be disappointed. Mr. Gibbons is concerned primarily with Portugal's southernmost province of Algarve, where life is simple, the people industrious, and traces of Moorish influence are still in evidence. Some fascinating pages are devoted to the tunny and sardine fisheries, while of the average Algarbian peasant Mr. Gibbons says, to emphasise the sobriety of his habits : "the veriest labourer in Algarve will do a pretty hard day's work for his master and then he will spend the evening in his own garden doing a bit more work for himself . . . and when he has finished then it is dark and time for bed and that is all about it."

The book is full of life, colour, and observation, while we particularly admire and laud the evident relish with which Mr. Gibbons travels by train, and the good use he makes of his eyes and ears during his journeys. A sense of contrast is a great asset to a descriptive writer, and as an example of how Mr. Gibbons manipulates the art, we would quote his passage on the church of Jeronymos at Belem, which concludes : "and then over the silences of that ancient cathedral rang out the triumphant cry of a small English child who wished to inform his mother and the world at large that he had done his wire puzzle at last." When he has so pleasant a touch, it seems a pity that the author cannot be a little more sparing in his use of the demonstrative "that," and of a certain indefinite substantive of wide but sometimes obscure application.

However, Mr. Gibbons would not be himself without "the thing," so we are prepared to condone the idiosyncracy.

Die Eisenbahn - Personentariftheorien. (Theories concerning the fixing of Railway Passenger Fares).

By Dr. rer. pol. Theo Füllés. Cologne : Gilde-Buchhandlung Heinrich Gonski. 8½ in. x 6 in. Paper covers. No price stated.—The fixing of railway rates and fares is a complex subject in which no great amount of scientific precision has been arrived at, in spite of an enormous amount of discussion and writing; doubtless this is because of the complexity of the problem, leading various investigators—in some cases—to diametrically opposed views on the very elements of the subject. Some idea of the literature that has appeared on it is given by the bibliography at the beginning of this booklet, containing 212 references, some of which are doctoral dissertations, and others articles in journals.

German works form the greater part of the list, but there are some leading foreign ones, sometimes in German translations. Herr Füllés remarks that another contribution to the collection may scarcely seem required; nevertheless there is call for one in which an attempt is made to set out the salient features of the numerous theories that have been advanced, and to trace their development. This the author has endeavoured to do, and, it appears to us, with considerable success; of his scholarship there can be no question.

Passenger fares are alone considered, as it is these which have particularly attracted the attention of investigators and involve certain special factors that are absent when dealing with freight rates. Herr Füllés begins by considering the pre-railway period, with the theories of Adam Smith, when post- and stage-coach fares required fixing in some relation to costs and the encouragement of business, and then turns to the early railway period, giving a number of interesting particulars regarding the running of different classes of carriage, the institution of special fares, return fares, and so forth. Lardner's celebrated work of 1850 on "Railway Economy" is referred to at length, marking as it did a great step forward in serious investigation. The works of other writers such as Belpaire, Cohn, Sax, Garcke, Schüller, Ulrich, Scharling, Brandon, Lehr, Rank, and many more are compared, and the leading ideas analysed. Of the English writers mentioned after Lardner, Sir W. Acworth is the most prominent. Mr. C. E. R. Sherrington's "Economics of Rail Transport in Great Britain" is cited.

The author is led to the conclusion that a satisfactory study of the subject, which should include the national and social economic aspects of it, combined with purely railway considerations, has

not yet been produced. Two important aspects of the matter have, he thinks, so far received scant attention, namely, the regulation of fares in difficult times—difficult for both transport undertakings and general commerce—and the establishment of a sound relationship between standard and special fares. In the 100 years since railways began, all sorts of opinions have been brought forward, and about the only point on which almost all writers agree is that rates should be based on a scale which falls with increasing distance. Herr Füllés' contribution to the question exhibits great knowledge, but his style is not an easy one to read, being extremely concentrated; to which of course the German language lends itself in an exceptional degree. The work forms No. 5 of a series issued under the auspices of the Transport Section of Cologne University, which specialises in investigations into the economics of the various systems of transport.

Insulating and Protective Tapes.

—The tapes listed in this catalogue from Callender's Cable & Construction Co. Ltd. are mechanically strong, easily applied, and of good dielectric strength. For insulating joints, tapes are supplied suitable for use on all types of cable, and for pressures up to 15,000 volts. Protective tapes are available for withstanding tropical conditions, water, and oil. Each batch of tape is made under scientific control and is critically examined in the laboratories before being passed into service.

Aluminium Production, Properties, and Applications.

Transport applications of aluminium figure extensively in this handsomely produced booklet from the British Aluminium Co. Ltd., Adelaide House, London, E.C.4. Among the numerous photogravure illustrations are several of railway vehicles, including a Coventry Micheline rubber-tyred railcar as recently tested on a cross-country route of the L.M.S.R. Advantages of aluminium construction for passenger vehicles which are referred to in the text are the fact that increased pay-load is carried for the same power consumption and maximum laden weight, and that depreciation is reduced. A special section is devoted to railways, in which the advantages to electric suburban traffic of the reduction of inertia at starting is emphasised, and a duralumin double-deck suburban carriage of the French State Railways is illustrated. Lightweight stock also has its bearing on permanent-way maintenance, in which connection the booklet quotes a recent statement in a paper read to the Institution of Locomotive Engineers, to the effect that one half of the cost of this work is directly proportional to the weight of the trains, while rolling stock maintenance is proportional to 60 per cent of its weight. Referring to aluminium for locomotives, reference is made to the reduced inertia stresses and wheel hammer resulting from aluminium connecting rods.

THE SCRAP HEAP

"Railway driver's good-bye to his engine." A tender farewell.—*From "The Star."*

* * *

A CHANNEL FERRY DEVELOPMENT?

Overheard at Marylebone just before the departure of the 3.20 p.m. Manchester express: "Oh yes, it is the fastest train of the day; called the 'Manchurian' you know."

* * *

It is said that buffers to railway trucks were first adopted on the Taff Vale Railway, and that the large English railway companies refused the offer when it was laid before them by the inventor.—*From the "Western Mail."*

* * *

"Why are so many coaches attached to a football team?" we are asked. For training purposes, no doubt.

* * *

After a long journey by rail, barge and funicular railway, four goats have been turned loose, under official auspices, in the Bavarian Alps. This is part of an interesting experiment which is being made by Dr. Hess, the Director of Hellabrunn Animal Park at Munich with the approval of General Göring, the National Hunt Master of Germany. The animals are ibex, or mountain goats, which will, it is hoped, settle on the Bavarian mountain side. They were transported by train in specially ventilated cases from Munich to Berchtesgaden, taken aboard a barge which was towed across the Königssee by motor

boat, and finally conveyed by the funicular railway to the 2,000 ft. high Röthwand mountain where they were released. Additional mountain goats from the Berlin Zoo are also to be set free on the mountains at this point later, under the same scheme.

* * *

An unusual feature in station decoration is to be found at Hammerwich station, L.M.S.R., where Stationmaster Knight and Porter-Signalman Davis have constructed a lily and fish pond, which is a source of great interest to passengers. The pond at present contains two water-lilies, other plants, and six goldfish, all of which are thriving. Another feature of the garden is a sunken lawn, fronted by a low wall, on which are growing rock plants of various kinds.

* * *

HAM AND EGGS, 4D.

Japan as a paradise for rail travellers was described by Mr. J. S. Shoppee in an address to the Geelong Kelvin Club. He said that on a 500-mile journey on the Tokyo express, with first class Pullman cars electrically heated, with hot and cold water, sleeping car accommodation and personal attention throughout, the entire journey cost 30s. plus 1s. 6d. for the sleeper. The Pullman cars, comfortably upholstered, offered second class fare at £1 and third at 16s. The distance was covered in 10½ hr. Beer on the train was 4d. a bottle, and ham and eggs 4d. Tea and rice supplied

It costs the G.W.R. over £40,000 each year to deal with "un-entered" traffic. You can help to reduce this waste.

DO YOU KNOW WHAT "UNENTERED'S" ARE?

IF YOU DON'T,
WHY NOT FIND OUT?
WITH YOUR HELP
THEY'LL BE CUT OUT

No. 9 of a series of "claims prevention" posters recently issued by the Chief Goods Manager, Great Western Railway, for exhibition to the staff

at wayside stations cost 4d. including a pot of tea, cup and saucer. One became the possessor of the crockery in this purchase. A bowl of boiled eel, a staple meal for Japanese, cost 4d., and here again the purchase of the bowl was included.—*From "The News," Adelaide.*

entail a curse on their posterity, as well as contribute to rob the present generation of immense sums which can never be repaid.

Grand Junction Railway.—This vast undertaking, which is to unite Liverpool and Manchester with Birmingham, is proceeding with great rapidity towards its completion. The men are at work day and night, and the eminent engineer (Mr. Locke), to whose talents the work has been entrusted, has it in contemplation to throw open the line for the purpose of travelling in the course of next summer. Great preparations are also making in the carriage department, fifteen splendid ones having already been completed at the manufactory at Liverpool, and forwarded to the depot at Warrington.

Pneumatic Railway.—We understand that Mr. Pinkus has commenced operations on the formation of a line of the pneumatic railway, near the banks of the Kensington Canal; that the engines and machinery are in a forward state of completion; and that Mr. P. expects to be able, within two months, to demonstrate his method of constructing and working a line of railway.

One Hundred Years Ago

Extracts from the September, 1836, issue of "The Railway Magazine" (afterwards "Herapath's Railway Journal") and the oldest constituent of THE RAILWAY GAZETTE

Brighton Railway.—After the most costly and prolonged contest in the two Houses, and upwards of eighty days in Committees, Stevenson's line of railway has followed the fate of Rennie's, Cundy's, and Gibb's, and was thrown out in the Lords' Committee by a majority of 17 to 8 peers. The resolution which disposed of it was as follows: "That it is inexpedient to proceed further with this Bill during the present session." Two only of the minority, and four of the majority, voted without hearing the discussion of evidence. The decision, therefore, as regards attendance, was *bona-fide*. The principal reasons for rejection, were the decided objections of the great majority of the inhabitants of Brighton to Stevenson's line, and preponderance in the Lords' Committee of the Brighton Junction Railway, a line uniting Brighton with the London and Dover (South Eastern) at Oxted, a cutting of not more than thirty miles. The announcement of the result at the Stock Exchange was received with

three loud cheers. The contest is reputed to have cost upwards of £100,000, and to have been remarkably profitable to the legal profession.

The Dover South-Eastern Line.—The directors of this line have already commenced operations near Oxted. We are glad to hear this; it looks like business. We are however sorry, but not surprised to hear, that they find it needful to apply to Parliament next session to amend their line between London and Oxted, it being said that the line granted by Parliament is either such as could not be executed, or such as if executed could not be worked to any profit or advantage If members of Parliament will undertake to legislate on subjects on which they are ill informed, or will go into the demerits of lines with a bandage put over their eyes and cotton in their ears, by interest or the twaddle of counsel, they will inflict an evil on the country not easily eradicated, and

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

ARGENTINA

Transandine Communications Interrupted

The Transandine train service was interrupted for several days in July owing to very heavy snowfalls, which blocked the line between Los Andes and Punta de Vacas. Mr. P. Jardine, an engineer of the railway, who was engaged in superintending the clearing of the track, lost his life, either through being swept away by an avalanche or falling over a precipice, at the bottom of which his body was afterwards found at a depth of 1,600 ft. Mr. Jardine, who was 38 years of age, was a native of Edinburgh, and served as a commissioned officer during the war.

Accident on the B.A.G.S. Railway

A serious accident, involving the loss of two lives, occurred on the B.A.G.S. Railway on August 4, through a heavy passenger train from Buenos Aires to Bahia Blanca colliding at a level crossing near Calderon station, 25 km. from Bahia Blanca, with a motor vehicle loaded with drums of naphtha. The lorry was completely destroyed, and the drums took fire. With great courage, the driver and fireman remained at their posts, although enveloped in flames, and brought the train to a standstill, thus preventing the fire from spreading to the coaches, in which most of the passengers were asleep. The driver of the lorry was killed outright, and the driver of the train also succumbed to his injuries, while the fireman and the second man on the lorry were both severely burned. None of the passengers was injured. It appears that the accident was due to the negligence of the men on the lorry. The crossing in question, although unprovided with barriers, is situated in a position which gives a clear and unobstructed view of the track.

Engineering and Transport Meetings

A joint meeting of the local branches of the Institutions of Electrical Engineers and Railway Signal Engineers was held in Buenos Aires on July 30, when the résumé of a paper on "Modern Developments in Railway Signalling" by Major L. H. Peter (originally read at the Institution of Electrical Engineers in London) was presented by Mr. W. E. Tremain, M.I.E.E., and discussed.

On July 31 a meeting of the Argentine and River Plate Centre of the Institute of Transport was held in Buenos Aires, when Mr. A. E. Saville Barton (Divisional Manager of the Compañia Internacional de Transportes Automóviles S.A., Cuyo Division) read a paper on "Some Experiences of

Road Transport in the Argentine Republic."

At a meeting of the River Plate branch of the Institution of Mechanical Engineers, in Buenos Aires on August 3, Mr. A. J. Musto, A.M.I.Mech.E., A.M.I.E.E. (representative of the Quasi-Arc Co., London), read a paper on "The Latest Developments in Electric Welding," illustrated by cinematograph films of the practice as applied to ships, oil storage tanks and bridges.

On August 7, a large number of members of the Buenos Aires Association of the Institution of Civil Engineers travelled up to Alta Gracia for the purpose of visiting the Central Argentine Railway quarries there, and discussing a paper by Mr. W. R. J. Murray, M.Inst.C.E., on "Maintenance Work on the B.A.G.S. Railway." The Chairman of the association, Mr. J. H. Taylor, M.Inst.C.E. (Assistant to the Chief Engineer, Central Argentine Railway) presided and opened the discussion, after which a visit was paid to the quarries, where Mr. J. Cochrane, A.M.Inst.C.E., described the geological formation of the rocks.

BRAZIL

Central Railway Electrification

A result of the Central of Brazil Railway electrification, the first section of which is due to be opened in January next, will be the temporary diversion of all long-distance passenger trains from the Dom Pedro II terminus to Alfredo Maia, the terminus of the "Auxiliar" (narrow-gauge) lines, and the utilisation of the former exclusively for suburban and outer-suburban services. This will involve, not merely a considerable amount of track-work and rebuilding and lengthening of platforms, but also the erection of carriage sheds and construction of approaches for road vehicles at Alfredo Maia. Simultaneously narrow-gauge trains normally using the latter station will be diverted to Francisco Sá, the terminus of the Rio d'Ouro section of the Central Railway. This arrangement will be in force for about six months, the estimated time required for building the first wing of the new Dom Pedro station. In connection with the foregoing, the Government has set aside 6,300 contos to indemnify owners of property to be demolished in the vicinity.

Communication Between Brazil and Bolivia

In the Chamber of Deputies recently Sr. Vandoni de Barros, representative of Matto Grosso, urged that railway communication between Brazil and Bolivia should be completed. The

E.F. Noroeste (from Baurú in the State of São Paulo to Porto Esperança in Matto Grosso), had, he pointed out, not yet reached its obvious terminal point, the city of Corumbá, close to the frontier of Bolivia, and at present reached circuitously by steamers plying on the Paraguay river. The great increase in the country's productive capacity, which had already followed the construction of the Noroeste, foreshadowed the advantage of facilitating commercial interchange by rail between Brazil and Bolivia. It should be noted that an examination of the proposed scheme was on the agenda of the Convention of Petropolis, of which the outcome was the organisation by the Ministry of Foreign Affairs of a Transcontinental Railway Commission, and that the latter had progressed considerably in its investigations, when the Chaco dispute (between Paraguay and Bolivia) arose and held up the work.

Air Competition

At the beginning of August a national air line, known as V.A.S.P. (Viação Aérea de São Paulo), began to operate a twice-daily service between São Paulo and Rio with two Junker machines of 300 km.p.h. cruising speed and room for 16 passengers and 1,500 kg. of mail. On the first day the machine from São Paulo crashed at the Calabouço aerodrome, Rio, and the service had to be suspended temporarily. German pilots are to be employed in the future, and additional machines are being acquired for the purpose of re-opening the service at an early date. With a flying time of 1½ hours between the two cities (say 2½ hours including transport to and from aerodromes), and a fare of 260 milreis single (less than double the fare on the "Cruzeiro do Sul" night trains), this will demand the serious attention of the Central Railway, whose quickest trains still take from 11½ to 12½ hours for the 500 km. run.

It is the intention of the V.A.S.P., if successful, to extend its scope and eventually link up all the principal commercial centres of Brazil by means of fast and frequent aeroplane services.

CHILE

Iquique-La Noria Railway

News from Chilean sources is to the effect that the Government has issued a decree terminating the concession granted to the Nitrate Railway Company, for the working of the above line, which will be taken over by the State. [This subject was referred to in a news paragraph on page 353 of our August 28 issue.—Ed. R.G.]

Earthquake and Storm Damage

During the month of July, the Chilean provinces of Antofagasta and Atacama were shaken by earthquakes, which caused damage and loss of life, although little injury appears to have been done to the railways. A few days later the entire country was swept by

a violent storm, the effects of which were specially severe in Valparaiso. Along the waterfront heavy seas broke over the railway line, throwing a locomotive off the rails and interrupting traffic between the Port and Barón stations.

Loan for the Arica-La Paz Railway

According to information from Santiago, the Ministry of Production has issued a decree authorising the Administration of the Chilean Section of the Arica-La Paz Railway to negotiate in Chile a loan of three million pesos (approximately equivalent at current exchange rates to £30,836) to be expended on the working of the line. The loan must be repaid within one year.

MANCHUKUO

South Manchuria Railway Estimates

The operating estimates for the year beginning April 1, 1936, are set out hereunder:—

	Revenue	Expenditure	Net Revenue
	Yen (1,000) (£1,000)	Yen 1,000 (£1,000)	Yen 1,000 (£1,000)
Railways	137,822 (8,269)	51,289 (3,077)	+ 86,533 (5,192)
Hotels	3,222 (193)	3,258 (195)	- 36 (2)
Ports and docks	14,949 (897)	11,638 (698)	+ 3,311 (199)
Mines	92,753 (5,565)	81,833 (4,910)	+ 10,920 (655)
Oil	7,655 (459)	6,280 (377)	+ 1,375 (82)
Local Government	8,381 (503)	25,397 (1,524)	- 17,016 (1,021)
General	3,619 (217)	23,249 (1,395)	- 19,630 (1,178)
Interest	30,003 (1,800)	44,693 (2,682)	- 14,690 (882)
Contingencies	—	1,000 (60)	- 1,000 (60)
	298,404 (17,903)	248,637 (14,918)	49,767 (2,985)

The expenditures on the ordinary account, which include £20,700 for extension of railway facilities at Rashin Port, are to be covered out of revenues. For the expenses of the extraordinary and special accounts, the company has been authorised to make a call on unpaid capital to the extent of 36 million yen, and to issue debentures up to 80 million yen. Towards the end of the financial year some concern was felt in Japanese financial circles about the smooth carrying out of the S.M.R. future loan programmes. The loans due for redemption during the next five years aggregate 235 million yen (£14 million), as follows:—

Loan No.	Amount in million yen	Date of redemption	Rate of interest (per cent.)
32	50	Aug., 1936	6
27	50	Dec., 1937	5½
28	35	June, 1938	5½
31	35	Aug., 1938	5½
29	35	March, 1939	5½
33	20	Dec., 1939	5½
35	20	May, 1940	5

Should conversion in some cases be found impracticable, then the effect on the money market might be serious. The management has now decided on a five year plan under which there will be no sudden increase of loan issues. It has been the policy of the railway company to take an interest, whenever possible, in undertakings which further the economic and industrial development of Manchuria, and to dispose of part of its holdings in those undertakings as soon as they were estab-

lished on a sound footing. In pursuance of this policy the company will in the near future sell at least half its holdings in a number of ancillary undertakings. In cases where the railway industry has some direct connection with subsidiary concerns, the S.M.R. will limit the disposal of its holdings to 50 per cent.; in other cases it will go further, and it may withdraw altogether from companies which are able to stand alone. It is understood that this policy has the approval of financial circles, and of the Governments in Tokyo and Hsinking.

Reorganisation and Development

The date of the final unification of the management of all railways owned either by the Government or by the South Manchuria Railway, has been fixed as October 1. The new organisation is to include a new Industry Department to be formed in order to encourage and promote agriculture and other industries, and to initiate such measures as mechanised farming

methods. This department will, it is hoped, be able in a short time to convert unremunerative lines into remunerative, in accordance with a new 10-year development plan. By the end of next year, when the third construction programme will be completed, the total route-mileage is expected to be 10,000 miles. A feature in the general development will be the development of the Mutankiang (Mutangchiang) district and the strengthening of the staff at that headquarters.

SOUTH AFRICA

Railways Financial Position

The results of working for the three months April to June show a revenue surplus of £261,275 over expenditure after allowing for special appropriations of £212,500 to betterment fund; £121,750 to deficiency in pension and superannuation funds; £250,000 to rates equalisation fund; £62,500 to reduction of branch line capital; £312,500 to renewals fund; £179,761 responsibility allowance; £62,500 to writing out of capital account discount and expenses on pre-Union capital; and £9,909 to writing down the value of obsolete aircraft. Revenue from transportation services only for the period totalled £7,547,871, an increase of £593,279 on the previous year. Working expenditure increased from £4,657,231 to £4,926,845.

INDIA

Rolling Stock Programme, 1937-38

It is understood that the Standing Finance Committee for Railways has approved of an expenditure of Rs. 207 lakhs on the rolling stock programme of the Indian railways for the year 1937-38. This expenditure does not include any provision for general service wagons, which will be considered at a later meeting of the committee in September next.

Ticketless Travel

The September session of the Legislative Assembly will possibly consider a Bill of Amendment of the Indian Railway Act, a draft of which has been circulated to elicit public opinion. The amendment is designed particularly to deal with the problem of ticketless travel, a practice which, according to recent estimates, cost the railways a loss of Rs. 50 lakhs per annum. The amending Bill proposes to authorise railway officials to arrest a person travelling without a ticket, who will, on prosecution, be liable to imprisonment. The provisions of the draft Bill under circulation include an important departure from the accepted principles of modern jurisprudence in the clause which throws upon the accused the onus of proving to the satisfaction of the Court that he had no intention to defraud the railway. Public opinion, though on the whole in sympathy with the objects of the amendment, is apprehensive of the grave dangers attending the practical application of wide powers conferred on railway servants under the new legislation.

Road and Rail Communications Dislocated

Twenty rivers in north and north-east India are in spate and the resulting floods have caused widespread damage in the United Provinces, Bihar and parts of Bengal and Assam. Miles of road are under water, and on August 8 the East Indian Railway Grand Chord line between Sasaram and Moghalserai was breached, when the principal trains had to be diverted to the main line. A limited goods service was also maintained via the main line till the breached section on the Grand Chord was repaired. The E.I.R. Fyzabad loop was also breached about three miles from Lucknow and the Dehra Dun Express had to be diverted to the Pertabgarh route. The Rohilkund & Kumaon Railway bridge over the Gumti at Lucknow has been declared unsafe for the passage of trains. In Bihar, the Bengal and North Western Railway traffic was greatly dislocated in various areas. The Chapra-Khaira service had to be suspended and a restricted service was maintained in the North Bhagalpore area. Some of the railway ferry services had to be discontinued. In the Sibsagar district in Assam, railway traffic between Simulguri and Sibsagar was suspended for a short time.

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BRITISH RAILWAY STATISTICS *"The Railway Gazette" monthly table for May, 1936, as compared with May, 1935, compiled from the Ministry of Transport Statement No. 198*

Description	Great Britain*	G.W.R.	L.N.E.R.	L.M.S.R.	S.R.
PASSENGER TRAIN TRAFFIC—					
Number of pass. journeys (ex. season ticket holders)	105,279,121	7,419,254	15,248,799	25,249,050	18,520,030
Increase (+) or decrease (-)	- 2,815,107	+ 14,014	+ 239,456	+ 503,823	- 181,855
Passenger receipts (excluding season ticket holders) ..	£4,367,486	£572,826	£865,406	£1,393,660	£960,786
Increase (+) or decrease (-)	+ £299,169	+ £49,414	+ £83,955	+ £126,267	+ £72,506
Season ticket receipts ..	£716,093	£45,932	£121,258	£190,677	£231,105
Increase (+) or decrease (-)	- £9,805	- £3,803	- £5,453	- £424	- £1,545
Parcels and misc. traffic receipts (excluding parcels post) ..	£1,115,796	£205,634	£326,361	£430,329	£132,636
Increase (+) or decrease (-)	- £36,588	- £7,453	- £13,257	- £13,766	- £641
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled) ..	21,954,499	5,050,323	9,983,399	10,410,029	1,348,285
Increase (+) or decrease (-)	+ 2,856,877	+ 440,720	+ 1,125,905	+ 1,560,553	+ 163,582
Net ton-miles (excluding free-hauled) ..	1,267,358,063	227,411,711	424,939,475	523,251,178	56,393,081
Increase (+) or decrease (-)	+ 186,808,006	+ 27,111,881	+ 63,781,321	+ 83,561,294	+ 6,528,176
Average length of haul (miles) (excluding free-hauled) ..	57.73	45.03	42.56	50.26	41.83
Increase (+) or decrease (-)	+ 1.15	+ 1.58	+ 1.79	+ 0.57	- 0.26
Freight traffic receipts ..	£7,051,366	£1,190,600	£2,267,000	£2,970,000	£391,410
Increase (+) or decrease (-)	+ £84,457	+ £142,600	+ £177,400	+ £436,000	+ £45,392
Receipts per ton-mile ..	1.335d.	1.26d.	1.28d.	1.36d.	1.67d.
Increase (+) or decrease (-)	- 0.046d.	-	- 0.11d.	- 0.02d.	-
Freight train-loads: Average train-load (tons) ..	128.38	130.42	134.33	126.98	109.86
Increase (+) or decrease (-)	+ 5.13	+ 1.41	+ 6.49	+ 5.81	+ 4.84
Net ton-miles—					
Per train engine-hour	1,032.53	1,066.53	1,095.92	1,000.48	871.10
Increase (+) or decrease (-)	+ 8.64	- 17.68	31.12	- 0.89	+ 23.21
Per shunting-hour	891.99	791.34	984.64	931.18	595.41
Per total engine-hour	478.56	454.28	518.65	482.29	353.67
Net ton-miles per route-mile per working day ..	2,787	2,666	2,961	3,319	1,227
Increase (+) or decrease (-)	+ 195	+ 103	+ 201	+ 278.00	+ 70
Wagon-miles. Total ..	369,244,939	65,931,337	126,868,561	156,379,020	18,041,218
Increase (+) or decrease (-)	+ 48,157,298	+ 7,453,117	+ 16,040,862	+ 22,667,339	+ 1,861,858
Percentage of loaded to total	66.73	68.03	64.32	68.27	66.17
Wagons per train. Total ..	35.18	35.06	35.71	35.31	32.54
Increase (+) or decrease (-)	+ 0.80	+ 0.15	+ 0.92	+ 1.02	+ 0.55
Loaded	23.48	23.85	22.97	24.11	21.53
Empty	11.70	11.21	12.74	11.20	11.01
Train-miles. Coaching—Per train-hour ..	15.23	14.32	14.34	14.56	17.74
Per engine-hour	12.25	11.41	11.17	11.18	14.71
Train-miles. Freight—Per train-hour ..	9.47	9.93	9.58	9.20	9.81
Per engine-hour	3.73	3.50	3.91	3.80	3.18
Engine miles. Total ..	46,107,958	7,375,794	12,660,135	17,041,472	6,087,254
Increase (+) or decrease (-)	+ 2,149,713	+ 490,187	+ 599,515	+ 789,520	+ 202,579
Mileage run by engines. Total train-miles—					
Coaching	22,855,507	3,185,116	5,194,664	7,308,918	4,447,134
Freight	10,494,452	1,880,551	3,553,108	4,428,193	554,476
Engine-hours in traffic. Total ..	4,889,396	841,460	1,448,639	1,902,679	497,182
Increase (+) or decrease (-)	+ 340,383	+ 64,581	+ 95,046	+ 151,522	+ 23,408
Shunting miles per 100 train-miles—					
Coaching	7.36	6.87	6.52	7.94	8.34
Freight	71.74	82.14	66.99	67.19	97.07

Passenger Traffic Statistics: Number of journeys, receipts, and receipts per journey (excluding season ticket holders)—May, 1936

Subject	Great Britain	G.W.R.	L.N.E.R.	L.M.S.R.	S.R.	Cheshire Lines	Liverpool Overhead	L.P.T.B.†	Mersey
Full fares—									
Pass. journeys ..	31,879,129	679,732	1,113,264	1,528,488	2,773,183	15,710	151,909	24,718,893	74,421
Gross receipts ..	£880,984	£76,378	£123,882	£127,202	£195,925	£2,679	£1,550	£36,390	£1,314
Receipts per pass. ..	6.63d.	26.97d	26.71d.	19.97d.	16.96d.	40.93d.	2.45d.	3.27d.	4.24d.
Reduced fares—									
Excursion and week-end—									
Pass. journeys ..	42,179,798	4,466,482	9,485,630	15,424,202	9,061,315	414,562	99,402	1,503,504	640,916
Gross receipts ..	£2,688,137	£405,679	£592,681	£1,008,089	£576,223	£26,533	£909	£33,813	£10,149
Receipts per pass. journey ..	15.30d.	21.80d.	15.00d.	15.69d.	15.26d.	15.36d.	2.19d.	5.40d.	3.80d.
Workmen—									
Pass. journeys ..	26,641,447	1,751,637	3,568,324	6,967,262	5,732,756	238,532	193,404	7,076,652	197,102
Gross receipts ..	£390,899	£26,190	£58,228	£113,639	£95,142	£4,150	£1,556	£79,068	£1,841
Receipts per pass. journey ..	3.52d.	3.59d.	3.92d.	3.91d.	3.98d.	4.18d.	1.93d.	2.68d.	2.24d.
Other—									
Pass. journeys ..	4,549,458	514,061	1,076,291	1,315,340	950,201	70,111	43,707	484,476	13,108
Gross receipts ..	£369,333	£55,555	£82,840	£126,718	£90,544	£4,641	£281	£4,684	£220
Receipts per pass. journey ..	19.48d.	25.94d.	18.47d.	23.12d.	22.87d.	15.89d.	1.54d.	2.32d.	4.03d.
Total—									
Pass. journeys ..	105,279,121	7,419,254	15,248,799	25,249,050	18,520,030	739,101	488,422	33,783,525	925,551
Gross receipts ..	£4,367,486	£572,826	£865,406	£1,393,660	£960,786	£38,197	£4,296	£453,955	£13,526
Receipts per pass. ..	9.96d.	18.53d.	13.62d.	13.25d.	12.45d.	12.40d.	2.11d.	3.22d.	3.51d.

* All standard gauge railways

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

GERMAN TURBINE LOCOMOTIVE PRACTICE

The subject is surveyed, and future developments forecast, by Herr Burmeister, of Essen

WHATEVER view may be held by others regarding the prospects of the turbine locomotive on railways, Herr Burmeister, a chief engineer of Essen, apparently believes that striking developments in this phase of railway traction are likely to take place in the not far distant future. His paper on the subject, which was published recently in *Glaser's Annalen*, first of all traces the history of the turbine locomotive in Germany, and gives results of tests made with the Krupp,

The pressure of 327 lb. was adopted without hesitation, as the boiler of the Maffei turbine locomotive built for almost the same pressure, has given excellent results, this being possibly due in the main to its being fed with pure condensation water. The locomotive is driven by a main turbine, and has an additional one for shunting and starting, in accordance with the arrangement adopted when rebuilding the two existing German engines. In this case the auxiliaries are also regulated automatically.

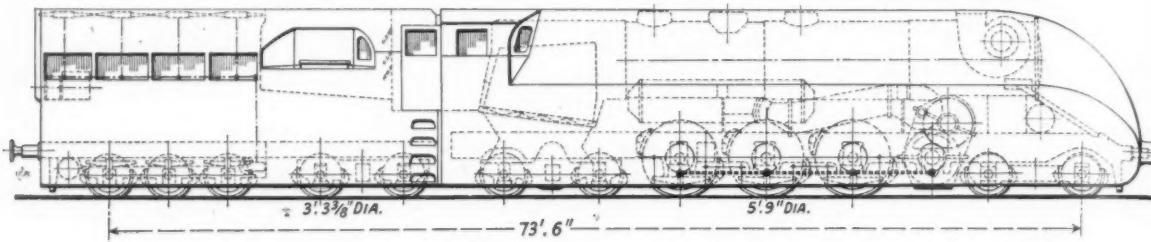


Fig. 1—Design for a condensing turbine locomotive with ordinary type of boiler (327 lb. per sq. in.)

Maffei and Henschel locomotives, all of which are built on the Zoelly principle. The author claims that the results obtained from these locomotives have, in the main, justified the adoption on a wider scale of turbine propulsion, and further and extended tests are, it is understood, about to take place in the Munich division with the Maffei locomotive.

When undergoing trials before being taken over by the Reichsbahn, the Krupp locomotive gave the very good coal consumption figure of 1.65 lb. per drawbar horsepower at 49.7 m.p.h., this being equivalent to 1,372 lb. per h.p.-hour at the turbine shaft. After rebuilding, a further improvement took place, the corresponding figures then being 1.54 and 1.32 lb., which is much below those of reciprocating locomotives. The machinery of this locomotive is now, of course, considered out of date, and by replacing the main turbine, improving the cooling apparatus in the tender, and raising the initial steam temperature from 572° to 842° F., a temperature presenting no difficulty with the steam turbine, it would be possible to reduce the coal consumption by a further 10 to 15 per cent.

Much information has been obtained from the tests made with the existing turbine locomotives, and this will be used in connection with future developments. It is now possible to plan and build what will probably be the final standard type of turbine locomotive. Diagram drawings of proposed turbine express locomotives have been prepared, and some of these we reproduce herewith.

The first (Fig. 1) is a condensing turbine locomotive with an ordinary type of locomotive boiler carrying a steam pressure of 327 lb. per sq. in., which is not excessive for this type. In view of the efficiency of the boiler, and to avoid the turbine exhaust being overheated, the steam temperature has been limited to 842° F., even though a higher temperature would still further improve the thermal efficiency without interfering with the turbine. The ordinary type of boiler has been retained on account of its great practical advantages and because, so far, no high pressure locomotive boiler has, according to the author, satisfactorily passed its service tests.

by the manner in which their driving turbine is fitted. The space required by the water cooling equipment, located on the tender, has been much reduced by the improved design, and the tender as a result can carry 6,500 gallons of water and 9 tons of fuel. The water is sufficient for a run of 250 miles when the engine develops 2,000 drawbar h.p. at a speed of 105.6 m.p.h., and sufficient coal is carried for about twice this distance. The locomotive has the 4-6-4 wheel arrangement and weighs 131 English tons in working order, of which 60 tons are available for adhesion. The maximum power of the turbine at full boiler output is estimated at 3,000 h.p. The boiler has a heating surface of 2,045 sq. ft. and a superheater temperature of 842° F.

The maximum speed of the engine is placed at 109 m.p.h. The tender in working order weighs 85 English tons, giving a total weight of 216 tons. Under constant working conditions this locomotive may be expected to show a 10 per cent. coal saving over a corresponding reciprocating engine. The same saving should be obtained in service, as the alterations previously referred to in the existing locomotives have almost completely overcome the waste of steam at starting and when shunting. A further saving is to be expected in maintenance costs in comparison with reciprocating engines, for it is claimed that with well designed and built turbines, gears and auxiliaries will require less attention. Boiler maintenance should be reduced to a minimum, as the condensed water feed should greatly minimise wear and tear. The customary weekly or fortnightly washing out is not needed, and in addition to the saving in wages that this represents, the engine availability is increased. The greater steadiness in running resulting from the absence of reciprocating parts represents a further saving by reducing wear.

With a boiler heating surface of 2,045 sq. ft., the locomotive develops 3,000 shaft h.p. continuously, for which power a reciprocating engine would require 3,230 sq. ft. of heating surface, representing the limit of manual firing. A turbine locomotive with 3,230 sq. ft. heating surface would develop about 4,700 h.p. and still be hand fired.

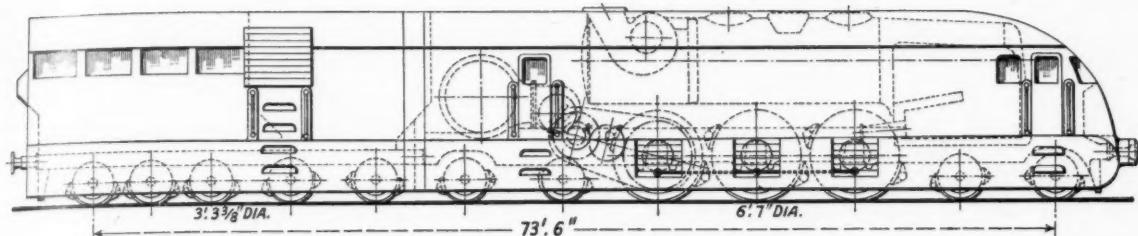


Fig. 2—High speed design having a La Mont type boiler with forced circulation (313 lb. per sq. in.)

A further fuel saving up to 45/50 per cent. could be made by raising the pressure to about 560 lb. per sq. in., but this would mean a special type of high pressure boiler.

A Speed Design with High-Pressure Boiler

To meet the latter requirements, the author presents a design fitted with a boiler of the La Mont type, having forced circulation for a pressure of 560 lb. per sq. in. and a superheated steam temperature of 617° F. As condensed water is used, no difficulty is to be feared in respect of the feed. The layout of the engine is new, the cab being at the leading end with the high pressure boiler immediately behind it. The turbine, auxiliaries and surface condenser are all arranged at the trailing end, and this layout has been made possible by the use of pulverised coal, which can be carried on the tender further away from the firebox and cab. The layout is so compact that a continuous shaft h.p. of 3,400 can be developed without exceeding the limiting wheel base of 73 ft. 6 in., the maximum length of a turntable. This locomotive will consume about 12,700 b.t.u. per h.p. at the turbine shaft, and so comes into the consumption figures of stationary engines. A 4-8-4 wheel arrangement is proposed.

The steam turbine is also of special interest for extra-high speed locomotives, and a design intended to show the possibilities in this direction is reproduced herewith, Fig. 2. This 4-6-4 locomotive has a separate tender and 6 ft. 7 in. diameter driving wheels, and is designed to attain a speed of 124 m.p.h. The difficulties experienced with high-speed reciprocating locomotives when starting, due to insufficient power at low speeds, do not arise in turbine locomotives with a starting and shunting turbine, and the diagram (Fig. 3) demonstrates this fact. This diagram refers to a locomotive having the characteristics just outlined in which (1) is the drawbar pull when the main turbine is working to full consumption (steam consumption 11.5 tons or 25,760 lb. per hour); (2) drawbar h.p. when the main turbine is working to full boiler capacity; (3) drawbar pull when running with the starting turbine (steam consumption 10 tons or 22,400 lb. per hour); (4) drawbar h.p. with the starting turbine; (5) drawbar pull when running with the main turbine at maximum power (steam consumption 14 tons or 31,360 lb. per hour); (6)

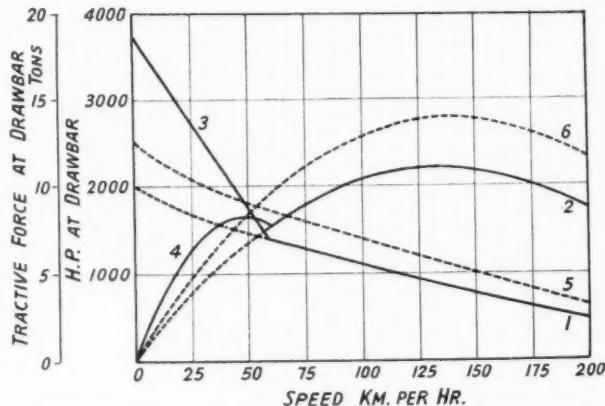


Fig. 3—Diagram showing characteristics of high-speed 4-6-4 design

drawbar h.p. when running with the main turbine at maximum power.

The cab is again placed at the leading end, which gives the driver a good look-out and enables the locomotive to be fully streamlined. The turbines at the trailing end are cased in. By using pulverised fuel the coal can be carried at the extreme back end, and the fireman's work is lightened as much as possible, which is a great advantage with such high speeds. In countries in which the fuel cost is low and the capital charge on the locomotive high, the use of direct exhaust turbines can be considered.

This proposed high speed turbine locomotive is estimated to weigh in working order 132 tons, with 60 tons available for adhesion. The maximum power developed by the turbine at full boiler output is 3,000 h.p. and the boiler heating surface is 2,045 sq. ft., with a superheated steam temperature of 842° F. The boiler pressure is 313 lb. per sq. in. and the maximum speed 124 m.p.h. The tender in working order weighs 85 tons and carries 6,500 gallons of water and 9 tons of coal.

The concluding diagram drawing (Fig. 4) shows a 4-8-4 turbine locomotive with a normal type of boiler carrying a pressure of 327 lb. per sq. in., and a steam temperature

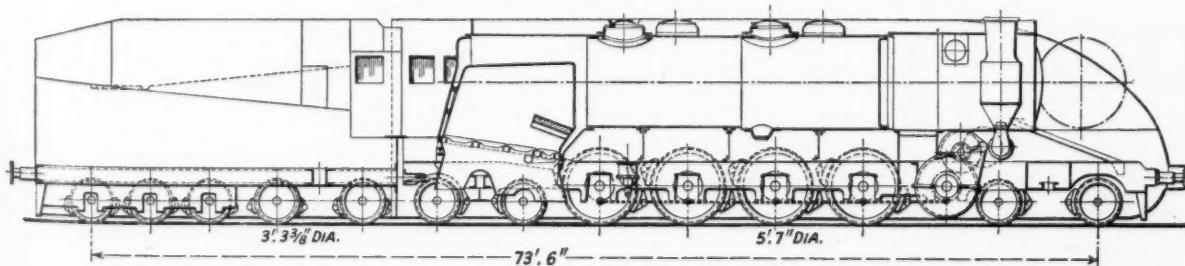


Fig. 4—A non-condensing design with normal type boiler (327 lb. per sq. in.)

of 842° F. It is of the non-condensing type, and differs from the usual reciprocating type of locomotive only by having a steam turbine in place of the usual cylinders and motion. The exhaust steam from the driving turbine passes direct to the blower, and a small turbine which can be cut out when not needed is provided for starting and shunting. A locomotive of this kind has, the author concludes, many advantages over the reciprocating type. The larger fuel saving due to condensing, and to the better boiler conditions when condensed water is used, has to be forgone, but the good riding properties and the low engine repair costs are retained, and in addition there is some 10 per cent. fuel economy.

This locomotive weighs in working order approximately 143 tons and has an adhesion weight of 79 tons. The maximum power developed by the turbine at full boiler output is 2,800 h.p.; the boiler heating surface is 2,906 sq. ft. The boiler pressure is 312 lb. per sq. in. and the maximum speed 87 m.p.h. In working order the tender weighs 84 tons and carries 8,153 gallons of water and 9 tons of coal.

Some of the claims made in Herr Burmeister's paper, and the figures by which they are supported, appear to us rather overdrawn in favour of the turbine locomotive. Publication of his remarks must therefore not be taken as implying that we necessarily concur in their entirety.

G.W.R. Express Vacuum and Accelerated "E" Freight Trains

Hazlitt thought that a nickname was the hardest stone the devil could throw, but the G.W.R. thinks differently, for in the recently published "Guide to Economical Transport" there has been included a list of nicknames given by the staff to the company's principal freight trains. Commenting on these names, which are set out below, it is suggested in this fascinating booklet that such names are terms of affection which serve to enhance the mere duty to ensure prompt despatch and the elimination of all possible delay, and seem to place a personal responsibility upon each man throughout the entire run.

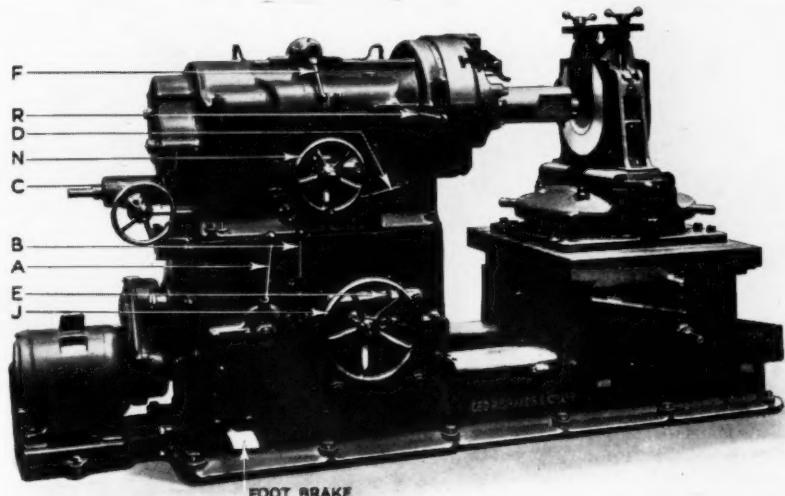
These "slang" names make an amusing contrast with those such as the Cornish Riviera Limited which have been bestowed only after much mental cogitation. Probably all are the children of some passing thought, suggested by the nature of the traffic handled, the associations of direction and country, or not infrequently by some personality amongst the men connected with the train—but each speaks of a different author. It must surely, for instance, have been a poetic porter that first dubbed the 4.20 a.m. Westbury to Wolverhampton the Moonraker.

Time	From	To	Name	Time	From	To	Name
1. 5 a.m.	Acton	Bristol	The High Flyer.	9.32 p.m.	Old Oak Common	Penzance	The Cornishman.
7.40 p.m.	"	Cardiff	The Early Bird.	8. 5 p.m.	Paddington	Bristol	The Shopper.
9.25 p.m.	"	Llanelli	The Leek.	9.10 p.m.	"	Birkenhead	Northern Flash.
3.40 a.m.	Banbury Jc.	Bristol	The Competitor.	9.35 p.m.	"	Carmarthen Jc.	The Welshman.
2.10 a.m.	Basingstoke	Wolverhampton	The Cherbourg.	10.10 p.m.	"	Laira	The Tamar.
9.35 p.m.	"	"	The B.B.C. (Basingstoke, Birmingham, Crewe).	10.30 p.m.	"	Cardiff	South Wales Borer.
3.55 p.m.	Birkenhead	Smithfield	The Meat.	10.50 p.m.	"	Weymouth	The Jersey.
6. 5 p.m.	"	Pontypool Road	The Feeder.	11. 5 p.m.	"	Wolverhampton	The Hampton.
8.20 p.m.	"	Paddington	The General.	11.15 p.m.	"	Bristol	The Western General.
9. 5 p.m.	"	Cardiff	The Mersey.	11.35 p.m.	"	Newton Abbot	The Devonshire man.
10.50 p.m.	"	Bordesley Jc.	The Birmingham Market.	12. 5 a.m.	"	Worcester	The Sauce.
11.35 p.m.	"	Oswestry	The Cambrian Pioneer.	12.15 a.m.	"	Fishguard	Irishman.
11. 0 p.m.	Birmingham	Paddington	The Pedlar.	12.30 a.m.	"	Bristol	The Mopper Up.
9.10 p.m.	Bordesley Jc.	Birkenhead	The Shipper.	12.10 a.m.	Park Royal	Stourbridge Jc.	The Stour.
10.10 p.m.	"	Swansea	The Hardware.	2.50 p.m.	Penzance	Paddington	The Searchlight.
6.50 p.m.	Bristol	Birkenhead	The Farmer's Boy.	7.20 p.m.	"	Plymouth	The Pasty.
7.40 p.m.	"	Paddington	The "Bacca."	5.40 a.m.	Pontypool Road	Newton Abbot	The Laira.
9.20 p.m.	"	Wolverhampton	The Western Docker.	10.30 p.m.	Reading	Laira	The Biscuit.
10. 5 p.m.	"	Leamington	Spa.	10.40 a.m.	Southall	Crewe	The Grocer.
10. 5 p.m.	"	Paddington	The Cocoa.	3.50 p.m.	Swindon	Tavistock Jc.	The Rasher.
10.55 p.m.	"	Laira	The Drake.	7.10 p.m.	Victoria Basin	Basingstoke	The Cargo.
12.25 a.m.	"	Carmarthen Jc.	The Bristolian.	4.20 a.m.	Westbury	Wolverhampton	The Moonraker.
3.50 p.m.	Cardiff	Hanwell Br. Sdgs.	The Stock.	7.35 p.m.	"	Manchester	The Lancashire Lad.
9.45 p.m.	"	Saltney	The Spud.	9.55 p.m.	"	Penzance	Western Flash.
11.10 p.m.	"	Paddington	The Ironmonger.	10.50 p.m.	West Drayton	Pontypool Road	The Northern.
12.55 a.m.	"	Swansea	Port to Port.	7.22 p.m.	"	Wolverhampton	The Drayton.
7.30 p.m.	Carmarthen	Paddington	The Up Welshman.	6.35 p.m.	Weymouth	Paddington	The Up Jersey.
8.35 p.m.	"	Bristol	The Open.	1.30 a.m.	Wolverhampton	Basingstoke	The Southern Docker.
11. 0 a.m.	Exeter	Pontypool Road	The Ponty.	2.10 a.m.	"	"	The Southerner.
4. 0 p.m.	"	Old Oak Common	The Flying Pig.	2.45 a.m.	"	Birkenhead	The Northern Docker.
12. 5 a.m.	Gloucester	Cardiff	The Bacon.	4. 0 a.m.	"	Crewe	The Northern Exchange.
7.50 p.m.	"	Paddington	The Cotswold.	8.15 p.m.	"	Paddington	The Racer.
11. 0 p.m.	Handsworth	Acton	The Queen's Head.	10.15 p.m.	"	Westbury	The Crosser.
8.20 p.m.	Kidderminster	Paddington	The Carpet.	12.45 a.m.	"	Birkenhead	The Flying Skipper.
7.45 p.m.	Manchester	Bristol	The "Mon."	6.45 p.m.	Worcester	Cardiff	The Worcester Fruit.
8.42 p.m.	"	Wolverhampton	The Early Riser.	8.35 p.m.	"	Crewe	The "Sparagras."
4.58 p.m.	Marazion	Bristol	The Tre Pol ard Pen Flier.				
10.25 p.m.	Margam	Bordesley	The Tinman.				
5.30 p.m.	Newton Abbot	Paddington	The Hackney.				

NEW MACHINE FOR AXLEBOX WORK

Built by George Richards & Co. Ltd., to the order of the L.M.S.R.

A NEW Richards patent axlebox boring, facing, and radiusing machine, built to the order of the London Midland & Scottish Railway, has recently been installed in the company's works at Crewe and Derby. The machine incorporates a facing head with slide having automatic reversible feeds, on which is mounted a tool-holder carrying the facing and radiusing tool, together with a powerful snout bar for boring and relieving operations. An inclined saddle with three rates of automatic longitudinal feed is mounted on the bed of the machine, also rapid power traverse in the same direction. On the top of this saddle there is located an auxiliary inclined saddle, having longitudinal hand adjustment to accommodate different sizes of axleboxes, the total vertical adjustment being 3 in. A vernier reading to 0.001 in. is fitted to the inclined plane for convenience in setting the vertical height of the axleboxes. A stop is used to locate the table in the exact central position. The T slots in the table are arranged parallel to the axis of the spindle, and this enables the fixture to be placed in the most convenient position for the machining of the axlebox.



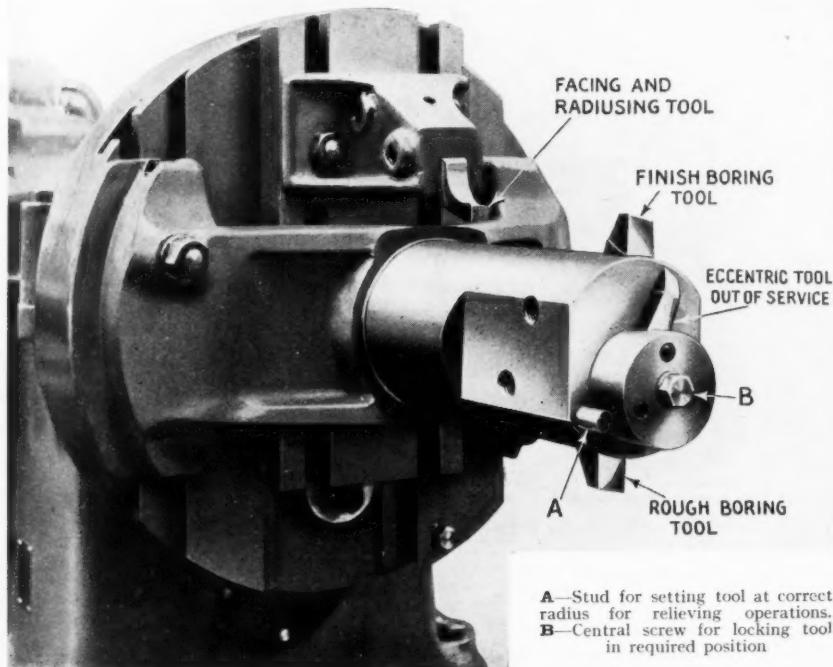
A—Start and stop. B—Speed change. C—Fast and slow speed change. D—Hand or power Feed to slide. E—Rapid power traverse, also hand or power feed to saddle. F—Feed variator. J—Hand control to saddle. N—Fine hand control to surfacing slide. R—Feed reverse

Axebox boring, facing, and radiusing machine

The axlebox is held in self-centring jaws actuated by a right and left hand screw, the latter bringing the axlebox truly central with the spindle of the machine, whilst locating pins between the horn flanges ensure that the box shall be central on the baseplate in the longitudinal direction. The cycle of operations on an axlebox is: (1)

Rough boring at high speed with single tool in snout bar; (2) finish boring at 300 r.p.m. with second tool in snout bar. At this stage adjustment is made to the saddle on the inclined plane to position the axlebox for cutting side relief and clearance in the keep. (3) Cutting side relief and clearance in the keep with eccentric tool. The axlebox is then brought back to its original centre by adjustment on the incline plane, for the facing and radiusing operations; (4) rough facing side of box; (5) finish facing side of box; (6) radiusing operation. The fixture is then swivelled through 180 deg. and the procedure finishes with (7) radiusing operation at opposite end of box.

The above operations were performed on a driving axlebox 8½ in. bore by 8¾ in. long, and the total floor to floor time was under 25 min. The machine is electrically driven by a 10-h.p. constant speed motor with totally enclosed silent spur gear transmission.



Complete tooling arrangement

THE BUGATTI RAILCARS AND THEIR SERVICES

Three French railways use these vehicles at start-to-stop average speeds up to 73 m.p.h.

BUGATTI railcars were first placed in regular service in France in the summer of 1933, when a four-engined 800 b.h.p. vehicle (described and illustrated in our issue of May 26, 1933, and subsequently) was delivered to the French State Railways. Since that time 11 further 800 b.h.p. cars with six trailers, and 37 two-engine 400 b.h.p. cars have been delivered to the State, P.L.M., and Alsace-Lorraine Railways, and just recently a further advance has been made by the purchase of a three-car train by the State Railways.

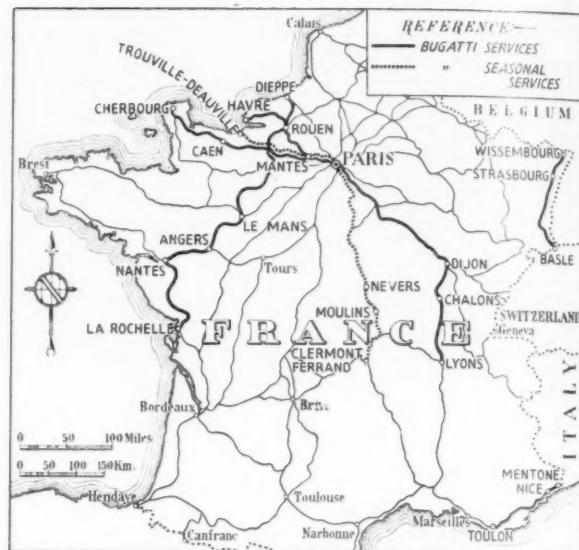
Several peculiarities characterise the Bugatti cars. In the first place they are the only internal-combustion engined railcars with direct drive in the world; secondly, they have a very high horsepower per unit of weight, ranging up to 25 b.h.p. per tonne of tare for the single-unit 800 b.h.p. vehicle; thirdly, they have a bogie layout and suspension which halves the vertical movement transmitted to the car of any given axle, and in partial consequence of which each bogie has eight wheels; and lastly they are allowed to run up to 150 km.p.h. in normal service, the highest speed permitted for any vehicles on French railways.

The general details of construction of both the 400 b.h.p. and 800 b.h.p. types are the same, but the second type is longer than the 400 b.h.p. units. The 800 b.h.p. car is used sometimes in conjunction with a trailer, which is non-driving in view of the driving position in the railcar being in a conning tower above the roof. Thus, in one direction, the railcar pushes its trailer. The railcar-trailer sets are known in France as Bugatti *couplages*. No provision for multiple-unit control is fitted to the Bugatti cars.

Engine and Transmission

The earlier cars had their engines arranged on one side of the car and at right angles to the centre of the drive to the axles, the line of drive being changed in reverse boxes adjacent to the engines. The standard drive is now with the engines arranged longitudinally, two 200 h.p. engines on each side of the car. Each bogie is driven by the two engines nearest to it, but these drive different axles—the centre pair of each bogie in the 800 b.h.p. car, and the inside centre axle in the 400 b.h.p. From the engine the torque is taken through a Daimler fluid flywheel and down a long driving shaft which is in two parts, the first, like the engine, supported on the under-frame, and the second a cardan shaft with flexible couplings which leads the drive to the reversing bevels on the axle. The bevels are operated by oil under pressure.

Bugatti-Royal petrol engines provide the motive power. Each has eight cylinders with a bore and stroke of 125 mm. by 130 mm. and the continuous output is 200 b.h.p. at 2,000 r.p.m. corresponding normally to a road speed



Map showing routes operated over by Bugatti railcars and trains

of 75 m.p.h. The maximum output is 250 b.h.p. at 2,700 r.p.m. The fuel is mixed in two Zenith carburetors and the ignition is provided by a Vertex-Scintilla magneto. The engines are started electrically. Cooling of the circulating water was effected in radiators at the ends in certain of the earlier cars, but the standard practice is for the radiators to be on one of the side panels.

The engine and transmission are controlled from a driving position in the roof of the car, just above the engines. Each engine, or pair of engines in the 800 b.h.p. cars, has its own throttle lever and reversing handles. The driver can work the throttle levers between the finger and thumb and it is the practice to move one forward a little and then the other. The engine room is fitted with a Tecalemit fire extinguisher which, operated from the driving position, sprays two jets of liquid on to the two carburetors of each engine. There is also a smaller Tecalemit extinguisher of the usual type. The oil and water pressure gauges and systems work in conjunction with red safety lights.

Body and Underframe

The body of the Bugatti is of steel construction in five independent sections which are bolted together with highly-compressed rubber blocks between each two

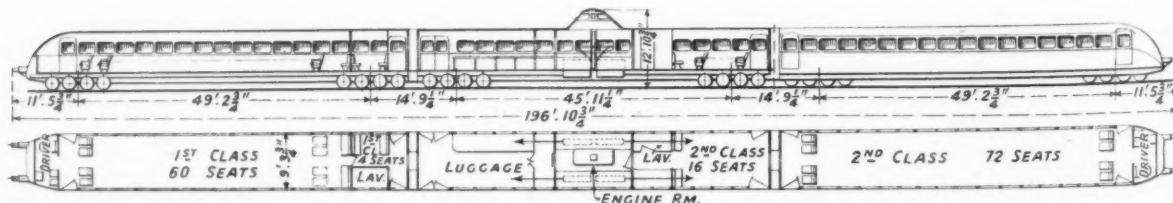
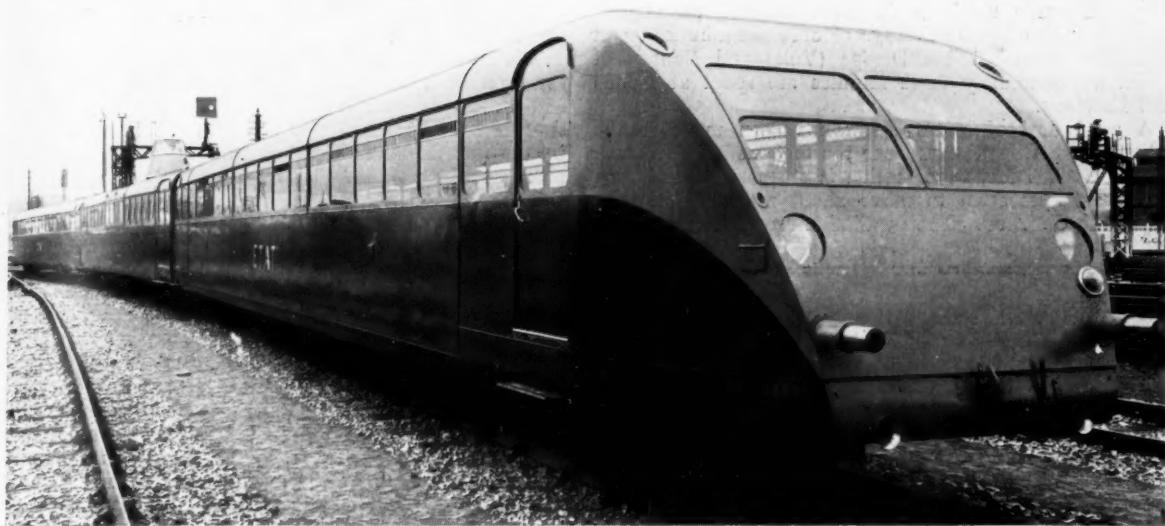


Diagram of the new 800 b.h.p. Bugatti train working on the Paris-Havre line



800 b.h.p. Bugatti train belonging to the French State Railways

sections and between the side panels and the floor plate. Each section is built up on a frame of channel sections braced together by others of the same shape, the whole being assembled by butt welding. The sides and roof are double panelled with an insulating layer of Celotex between. On certain cars the interior panel plates are of aluminium. The underframe has two main longitudinal members 0.315 in. thick, and these, as well as the main cross braces, are formed of steel pressings. The body is entirely separate from the underframe and is carried by a number of spherical pivots resting in cup-shaped supports attached to the solebars and cushioned with rubber. Reversible seats on steel tube framing are provided, and the passenger saloons are heated by the engine exhaust gases.

Bogies and Braking

Forged steel framing is used for the bogie, and it supports four groups of two laminated springs, each group being attached to a Timken roller bearing axlebox at the ends and at the buckle to a knuckle joint on the bogie frame structure. The opposite pairs of springs and the two axles which they connect form a parallelogram which can deform horizontally. The carrying axles are of the fixed or automobile type, and the driving axles of the usual railway type. The underframe rides on the bogie through four long laminated springs, two to each bogie, which are attached at their ends to the bogie frame and at the buckles through a spherical bearing to the solebars of the underframes. The bogie centre is used for pivoting only, and carries no weight; it consists of a vertical cylinder containing oil and a piston on which rests a spherical bearing secured to the underframe. When vertical oscillations occur the oil is compressed, but vertical holes drilled in the piston allow of a gradual release in pressure. Extensive use is made of rubber cushioning blocks at the pivot and throughout the bogie, and the same

material is used in the wheels, which are made elastic by the insertion of rubber between the steel centre and steel tyre.

Braking is on the Westinghouse compressed air system, and the retarding force is applied to drums between the wheels. An unusual feature is that the braking force from the cylinder is transmitted to the shoes through cables. A hand brake is fitted also, and instead of slotted levers to permit of one brake being applied without affecting the other, a system of chains has been evolved.

Brief particulars of the Bugatti cars now in service are shown on the attached table. Practically all of them are engaged in fast services, and the range of their operations may be seen by reference to the accompanying map.

The speed capacities of the Bugatti cars are utilised to the full, and on runs with several stops they appear to be driven like a racing car. The acceleration and deceleration are smooth but exceedingly rapid, and, owing to the low centre of gravity, curves can be and are taken at high speed. On long sinuous cross-country runs such as that between Dieppe and Nantes, where the average for the 315 miles is just over 60 m.p.h., including seven

BUGATTI RAILCARS IN FRANCE

Railway	Numbers	No. of Railcars	B.H.P.	Tare Weight, Tonnes	No. of Seats	Date Set to Work
Etat	ZZy24401-9 ..	9	800	32.0	48	June, 1933-35.
	ZZy24421-5 ..	5	400	23.5	36	May-July, 1935.
	ZZy24426-35	10	400	26.0	44	November, 1935- August, 1936.
	ZZy24451-2 ..	2*	800	65.0	152†	June, 1936.
P.L.M.	ZZ.K1-3‡ ..	3	800	54.8	74	October, 1934.
	ZZ.K101-6 ..	6	400	24.7	44 (3 off) 52 (3 off)	July-October, 1935.
	ZZ.K201-14	14	400	32.0	52	November, 1935-36.
Alsace-Lorraine	?	2	400	20	78	May, 1935.

* Three-car set train, non-articulated

† 64 first, 88 second

‡ Close-coupled railcar and trailer, not separable as in the Etat *couplages*

stops, these features are very noticeable. How the Bugatti's hustle up both station work and passengers' speed is shown by the average of only six minutes spent in station stops between Dieppe (Ville) and Nantes, of which approximately three minutes are spent at Rouen and Le Mans.

A good deal of improvement has been made in the riding of the Bugatti cars since the first models appeared, but to English ideas the motion is still somewhat harsh, and the bogies seem to move about a good deal in a transverse direction. The ventilation seems to leave room

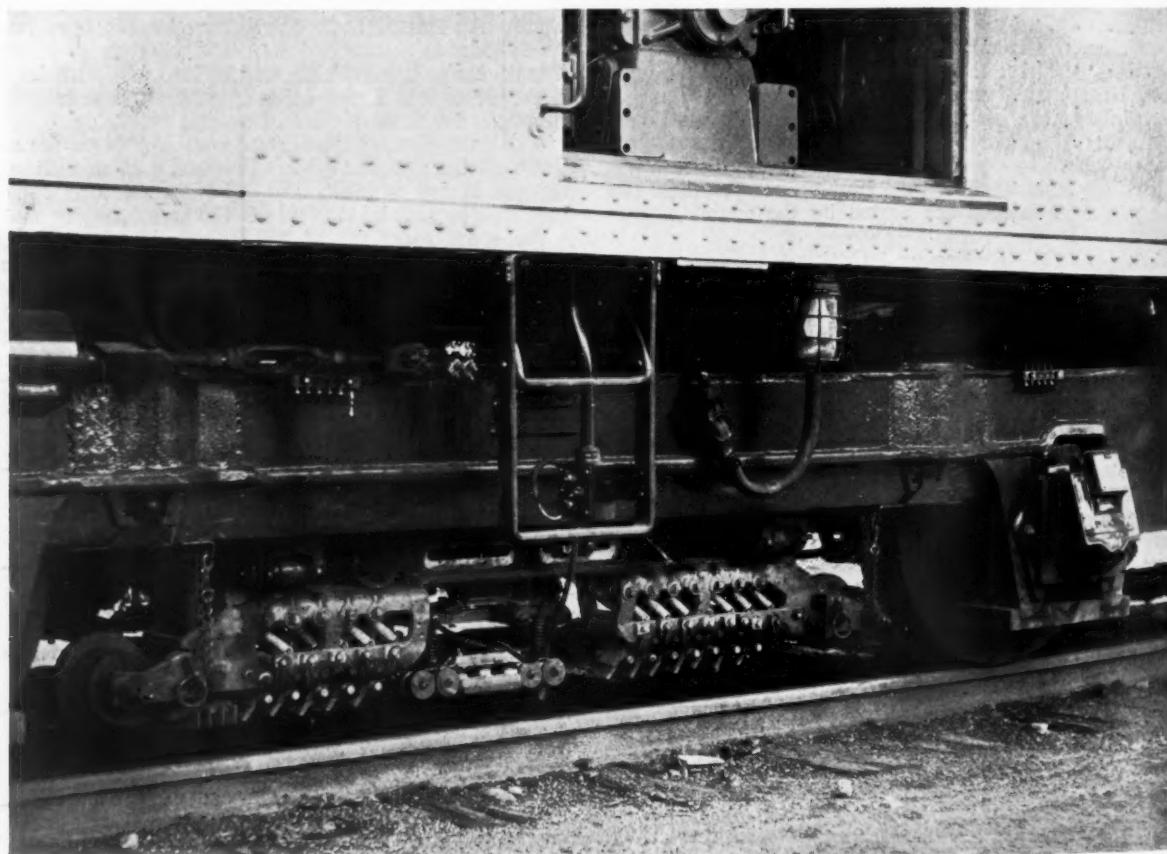
for improvement, but the seating is always comfortable and no part of the body or any fitting gives the slightest suspicion of rattle.

The latest Bugatti vehicle is a three-car non-articulated set train with four engines developing an aggregate of 800 b.h.p. on the continuous rating. An important departure has been made from previous Bugatti practice by the installation of Cotal electro-magnetic gearboxes in place of direct drive. Hydraulic couplings are used as before. The general layout of this train is shown in the accompanying diagram.

Sperry Rail Detector, Canadian Pacific Railway

EXAMINATION of rails for defects on the Canadian Pacific Railway has been carried out for six consecutive years by the Sperry Rail Service. A petrol electric single unit detector car is passed over the line at a constant speed of 7 m.p.h. Mounted under the car are two searching units, one over each rail. A pre-energising unit passes an electric current through each rail while the searching units pick up indications of possible hidden defects, and through a series of induction coils and relays record their position on a chart which moves over a table in the operating room of the car. As a possible defect is marked on the chart an electrically operated paint gun deposits a daub of paint on the rail.

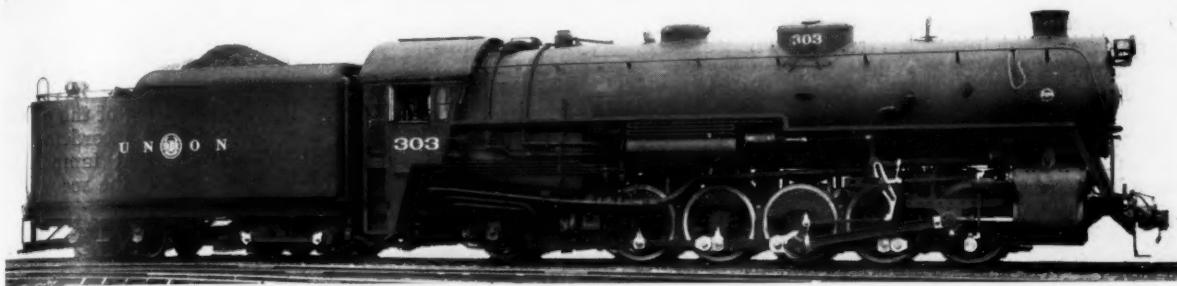
A second car with petrol mechanical drive passes over the same route two or three days later, with the chart made by the first car set up in it so that it moves over a table in view of the operator. The mechanism actuating the travel of the chart is so arranged that an audible warning signal is given in the car as it approaches the defect marked in time for the car travelling at about 40 m.p.h. to stop at the location of the paint mark on the rail. The crew of the car then makes a detailed examination of the suspicious rail, using a hand testing device which indicates the size of the defect when a transverse fissure is present. It is then decided whether or not the rail should be allowed to remain in the track.



The Sperry searching unit with multi-tandem pick-up coils, mounted on the detector carriage suspended flexibly from the beam of the brush carriage

A NEW AMERICAN LOCOMOTIVE TYPE

Built for shunting and transfer service, this class, which has the 0-10-2 wheel arrangement, is known as the Union type

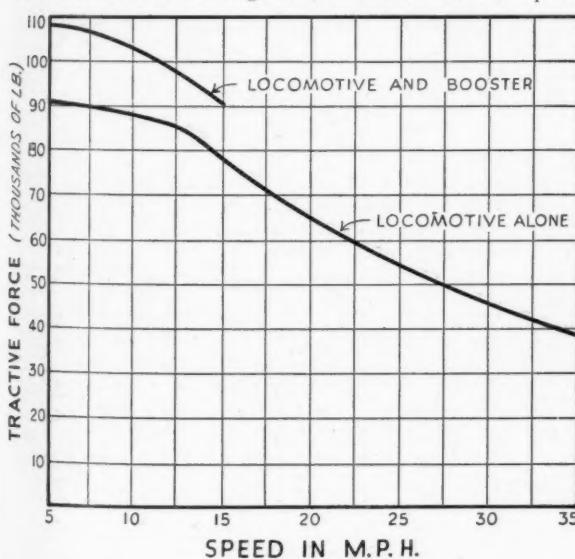


THE Baldwin Locomotive Works has recently built to the order of the Union Railroad five heavy shunting locomotives of the 0-10-2 type with booster tenders. This constitutes a new classification, and the name of the purchasing railway has been applied to it. It was required to increase the tonnage hauled, and to dispense with assisting locomotives. In order to obtain the required tractive force, it was necessary to use five pairs of coupled wheels with a two-wheeled pony truck at the rear for carrying the overhanging weight of the large firebox, and to meet the shop and turntable restrictions, the total wheelbase of the engine and tender had to be limited to something under 70 ft. As the locomotives were for slow speed service, no carrying wheels at the front were required, and this resulted in the evolution of a wheel arrangement which has not previously been used.

The boiler has an unusual capacity for a locomotive built for shunting and transfer service. It has a heating surface of 4,808.2 sq. ft., or with superheater 6,197.2 sq. ft., and is capable of evaporating 63,000 lb. per water an hour. With a steam pressure of 260 lb. per sq. in. and 200° of superheat, a potential boiler h.p. of about 3,550 is afforded. The grate has an area of 85.2 sq. ft.

and its ratio to heating surface is 1 to 56.4. The boiler is conical in shape, the first ring having an outside diameter of 7 ft. 6 in., increasing to 8 ft. 2 in. outside the third section. The radial stayed firebox is 10 ft. long by 8 ft. 6½ in. wide, with a depth of 7 ft. 7½ in. at the front and 6 ft. 3½ in. at the rear. The combustion chamber extends into the barrel of the boiler, a distance of 3 ft. Three thermic syphons are built into the firebox and support the sectional brick arch. Mechanical stoking apparatus is fitted. The coupled wheels are fitted with Baldwin disc centres, providing proper cross-counterbalance in accordance with present American practice. The piston valves, actuated by Walschaert gear, are 12 in. diameter and have steam ports 27.7 in. long by 2½ in. wide. The valve travel is 7¾ in.; other particulars are: lead ½ in.; steam lap 1¼ in.; exhaust clearance nil; and eccentric crank throw 19¼ in. Power reversing gear is used. The bar frames, of cast steel, are bolted to a rear cradle of cast steel which also forms the footplate of the locomotive. The main particulars are as follow:—

Cylinders, dia.	...	...	...	28 in.
Piston stroke	...	...	...	32 in.
Wheels, coupled, dia.	...	...	...	5 ft. 1 in.
“ trailing, dia.	...	...	...	3 ft. 6 in.
Wheelbase coupled	...	...	...	22 ft. 0 in.
Total (engine)	...	...	...	32 ft. 0 in.
Boiler, working pressure	...	...	...	260 lb. per sq. in.
Heating surface :				
Firebox	...	...	...	248.6 sq. ft.
Combustion chamber	...	...	...	76.1 “
Tubes	...	...	...	4,359.5 “
Thermic syphons	...	...	...	124 “
Total	...	...	...	4,808.2 “
Superheater	...	...	...	1,389 “
Combined heating surface	...	...	...	6,197.2 “
Weight on coupled wheels	...	...	...	153 tons 10 cwt.
“ total (engine)	...	...	...	180 tons 10 cwt.
“ engine and tender	...	...	...	287 tons 13 cwt.
Grate area	...	...	...	85.2 sq. ft.



Maximum tractive force available at various speeds from 5 to 35 m.p.h., with and without booster

The forward bogie of the tender incorporates a Franklin reversible booster with 50 per cent. cut-off designed for 17,150 lb. tractive force at starting speeds. The factor of adhesion is 6.35 with tender loaded, 4.27 one-third loaded, and 3.18 with the tender light. The tender has a capacity of 12,000 U.S. gallons of water and 14 U.S. tons of coal. The tank is rectangular in shape and welded throughout. The locomotive alone develops a tractive force of 90,900 lb. at starting speeds, and this, added to the 17,150 lb. of the booster, gives a total of 108,050 lb.

SELF-PRINTING TICKET MACHINES

The machines described possess a flexibility of operation not hitherto found in railway ticket machines

SELF-PRINTING ticket machines have already proved their economy and efficiency on short-distance railway systems, where it has been found that they are a most effective means of collecting and controlling revenue. On main-line railways, too, there is scope for their use at points whence a large proportion of the traffic is to a comparatively small number of stations. Bell Punch Co. Ltd., of 39, St. James's Street, London, S.W.1, has now added to their usefulness in this direction by produ-

model measures only 21 in. in width, and, in a counter space of only 40 in., it is possible to place two machines, a 6-way and a 4-way, to issue 10 different tickets. The machine is available in five sizes, to issue from two up to six tickets. Each ticket is serially numbered and dated, or serially numbered at both ends; the setting of the dater is a simple matter. The mechanical issue recorders are directly driven and totally enclosed so that tampering with the record is made extremely difficult; the recorders

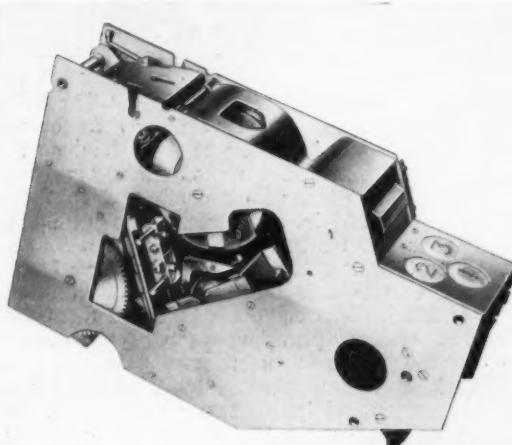


Fig. 1—Printing unit of S.P. machine

cing a range of machines in which tickets of different lengths can be produced, so accommodating various amounts of printing.

The tickets can be of any length from 1½ in. to 5 in., and tickets of different colours are obtainable from the same machine. The standard width of ticket is 1⅛ in., but machines can be supplied to produce tickets of any width from 1 in. up to 2 in. The variations in length are controlled automatically by the size of the printing plate.

Other features of the machines which will appeal in particular to the administrations of overseas railways are their suitability for operation by native staff; the arrangement of the printing, issuing and recording mechanism as a single unit, which can be replaced in a moment without calling for mechanical skill; and finally that any ticket material, paper or card, can be used.

The Bell Punch range of self-printing ticket machines for railways consists of three types: the S.P. (Self-Printing) machine for ticket offices; the S.P.A. (Self-Printing Autoslot) machine for platform use; and the S.P.R. (Self-Printing Restaurant) machine for control of restaurant revenue.

The S.P. differs from all previous self-printing machines in that each printing unit (Fig. 1), being separate and self-contained, has its own reel of ticket material. In consequence, each price of ticket can be of a different colour, a feature which has been found very advantageous in road traffic revenue collection, and has certain advantages for rail traffic, particularly overseas. This feature does not result in an unwieldy machine, for the 6-way



A six-way machine incorporating S.P. units, showing separate reel feeding each printer

are irreversible and of very stout construction, and legibility is a noticeable feature.

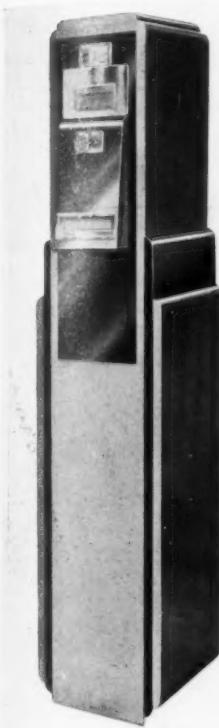
When special tickets are required, as for excursions, stereos of the type matter can be sent to all stations concerned, which can then print and issue the tickets in the numbers called for.

The S.P.A. machine (Fig. 2) is intended as a supplement to the ticket office S.P. machine, to issue the same or different tickets, to augment the ticket service when this necessity arises and to produce platform tickets if these are required. The machine is coin-operated and is supplied for operation with single and several coins. In the main the machine is identical with the S.P., except that the key-operated mechanism is replaced by coin selection and accepting mechanism, and by the inclusion of the electrical drive and transmission as part of the assembled unit. The purpose of the latter is to enable the whole mechanism to be removed for storage when it is used in seasonal enterprises.

The S.P.A. illustrated is similar to that which was

Fig. 2 (left)—S.P.A. coin-operated ticket machine

Fig. 3 (below)—S.P.R. machine for restaurants



used at the Brussels Exhibition but it is not essential that the machines should stand singly; several mechanisms can be incorporated in one casing for inclusion in a wall or pillar. The only necessity is that access is possible both from the front and from the rear.

The S.P.R. machine (Fig. 3) is designed for the American system of restaurant revenue control, using a machine which prints restaurant checks at the time of issue. It obviates the collection of cash by the waiting and serving staffs, concentrating this on to the cashier. Each check is printed with price sections which are marked

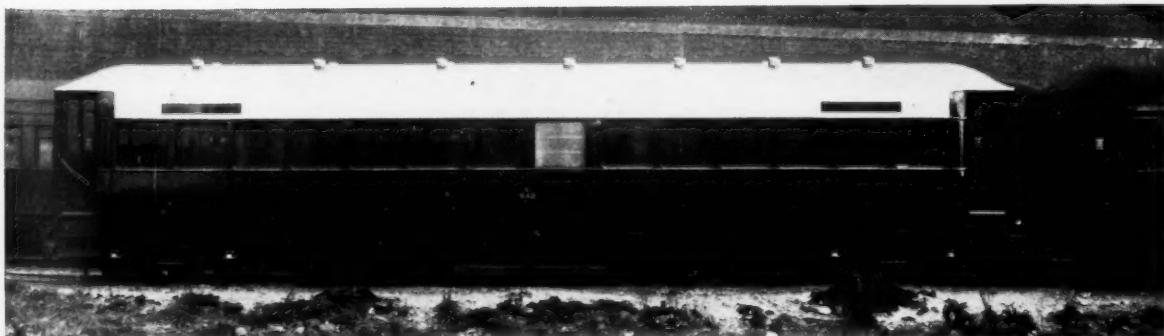
or perforated by the waiting or serving staff, from which markings the cashier is able instantly to total the account. Features of this machine are the prevention of any customer receiving more than one check, and mechanical recording of the issues, from which the restaurant manager can produce statistics hour by hour, day by day, without labour.

All three machines described incorporate the Bell Punch patent dry inker, which not only ensures clear and even printing under all climatic conditions, but obviates the risk of purchasers' hands or gloves being soiled by the delivery of a ticket in which the ink is not completely absorbed. Rapidity of issue is a feature of the equipment both of the key and coin operated types. The S.P. machine will deliver, as desired, one, two, or three tickets at one depression of a key.



Close up view of dating mechanism of S.P.A. machine shown in Fig. 2, showing method of setting

Up-to-Date Rolling Stock in New Zealand



New Zealand Government Railways second class coach covered with Flexometal panelling. The long panel from the bottom-side to window level is a super-size aluminium Flexometal panel 44 ft. long by 2 ft. 9 in. wide. It consists of plywood faced with an unbroken skin of aluminium. The roof is also of Flexometal, copper-faced on to Flexo plywood in super-size panels, pre-formed to the required curvature

NEW FACILITIES FOR OCEAN PASSENGERS AT PLYMOUTH DOCKS

Improved and modernised accommodation provided by the G.W.R. for passengers disembarking from ocean liners

IN order to provide greater comfort and convenience for the large number of passengers disembarking from ocean liners at the G.W.R. docks at Plymouth, much improved and modernised accommodation has just been provided by the company, comprising a fine new reception and refreshment hall at the Docks station.

Passengers are now provided with a large, lofty and well-lighted hall, with seating capacity for 170 persons, that contains kiosks for the despatch of telegrams and cables, the transaction of postal business, exchange of money, and registration of luggage. This hall, which has a single entrance, also serves generally as a



Corner of the new reception and refreshment hall at the Plymouth Docks station, G.W.R., showing the post office and cable kiosk, the offices for baggage and railway ticket booking, and the bookstall



Buffet side of the reception hall at Plymouth Docks. The thermostatically-controlled system of cooling ensures keeping the refreshments at a fixed temperature

waiting and retiring room. On one side is a refreshment buffet equipped with a modern system of cooling which enables the section under the counter to be kept at a fixed temperature by means of a thermostatically-controlled compressor.

As may be seen from the illustrations reproduced on this page, the scheme of decoration throughout the building has been designed to create an air of cheerfulness and brightness. The lower parts of the walls are tiled in white, and where the tiling finishes there is a pleasing green border. The floor is covered with Korkiod in an attractively coloured tile pattern, the colours of which harmonise with the leather upholstered chairs and settees.

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RAILWAY NEWS SECTION

PERSONAL

We greatly regret to record the untimely death through a lift accident of Mr. Percy J. Chadwell, a General Passenger Agent in the European organisation of the Canadian Pacific Railway. Mr. Chadwell joined the company's services in July, 1912, and proved himself an expert in secretarial work in the department of the late Mr. H. S. Carmichael, European Passenger Agent. He was Secretary to Mr. Carmichael in the Department of Ocean Services of the Canadian Pacific in 1916, and in June, 1917, joined the Army and saw service until December 31, 1919. On January 1, 1920, he was transferred to the company's European head office, Trafalgar Square, as Clerk in the Passenger Department under Mr. H. G. Dring, European Passenger Manager. On May 1, 1922, he became Conference and Atlantic European Rates Clerk and advanced to the appointment of Conference Representative for the Canadian Pacific on January 1, 1930. On August 1, 1934, Mr. Chadwell was appointed a General Passenger Agent for the Canadian Pacific European organisation, which position he held at the time of his death. The funeral service took place on September 9 at St. Martin-in-the-Fields, and the company's London head office was closed for two hours.

On Saturday last, a bronze plaque was unveiled by the Lord Mayor of Newcastle (Alderman W. Locke), a Bedlingtonian, outside the King's Arms Hotel, Bedlington, Northumberland, to mark the birthplace of Sir Daniel Gooch. Sir Daniel was the first Locomotive Superintendent of the G.W.R. (from August, 1837, to October, 1864) and Chairman of the company from November, 1865, to October, 1889. He also laid the first Atlantic cable, completed the steamer *Great Eastern*, drove the train in which Queen Victoria made her first railway journey, and brought Cleopatra's Needle to London. The plaque was placed on the house by the members of the Bedlington Society.

Mr. G. Bener, the General Manager of the Rhætian Railway, has retired and has been succeeded by Dr.-ing. Branger.

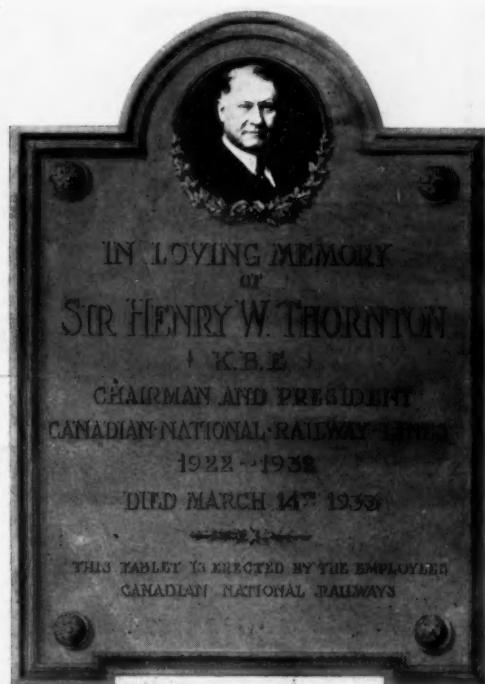
Mr. C. H. Jukes, Chief of the Statistics Department, Central Argentine Railway, returned from European leave of absence on August 10.

Dr. Luis P. O'Farrell, Chairman of the Local Board, Buenos Ayres & Pacific Railway, sailed for England by the Royal Mail motorship *Asturias* on July 31, on a business and pleasure trip.

We regret to record the death, on September 1, of Mr. William Rowland, who died suddenly while on holiday in Westmoreland. Mr. Rowland was Chief Locomotive Draughtsman of the Great Central Railway from 1902 until grouping, and continued at Gorton up to his retirement on March 30, 1929. His early training was in the shops of D. Rollo & Sons, Liverpool, after which

Draughtsman, Great Central Railway, on February 19, 1906. Mr. Rowland will also be remembered for his valuable contributions to the dissemination of engineering knowledge, both by his articles in THE RAILWAY GAZETTE, and particularly by the lengthy and exhaustive series, published in *The Railway Engineer* between April, 1915, and August, 1924,

Memorial plaques of the design shown alongside are being placed in eleven terminal stations of the Canadian National Railways to the memory of Sir Henry W. Thornton. The tablets are being erected by C.N.R. employees. Earlier reference to these plaques was made in our issue of March 27

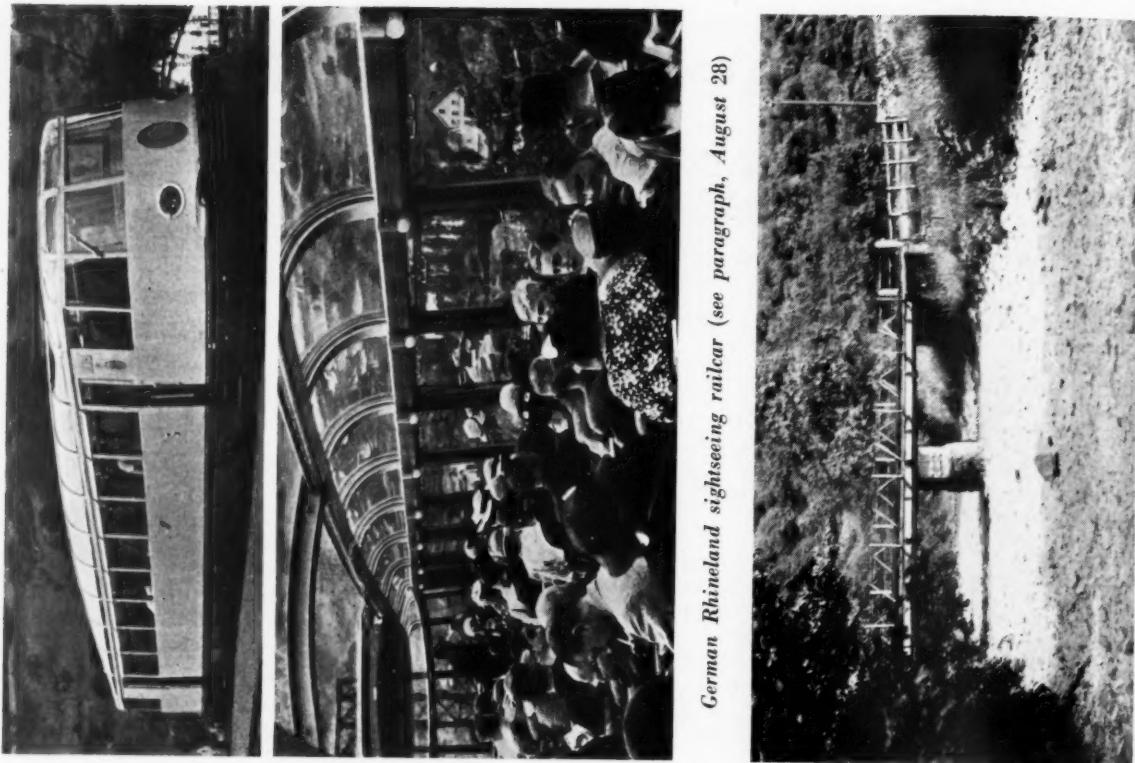


he became a student of University College, Liverpool, under Professor Hele Shaw. Gaining a Whitworth scholarship, he served for some months in the drawing office of C. Jones & Sons, the Liverpool shipbuilders and engineers. He next obtained an appointment at Crewe works, L.N.W.R., where for five years he was engaged on the design of locomotives, outstation work, buildings, hydraulic plant, and so forth. Proceeding in 1896 to the Lancashire & Yorkshire Railway works at Horwich, he spent a year on special designing and experimental work. His next experience was with Beyer, Peacock & Co. Ltd., where for three and a half years he had charge of many and varied locomotive designs, as well as of extensive additions to the company's works in the shape of boiler plant, steel foundry, and electrical installation. Five years as Engineer and Electrician to the Vulcan Foundry Co. Ltd., Newton-Le-Willows, preceded his appointment as Chief Locomotive

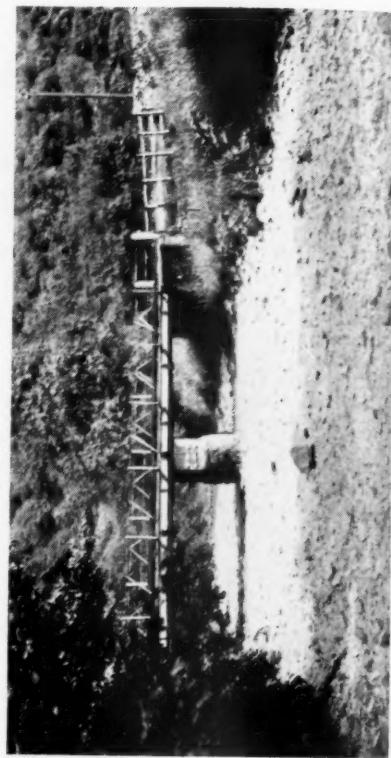
on "Modern Locomotive Engine Design and Maintenance," of which, under the pseudonym "Δ. ψ. ω." he was part author.

We regret to record the death in Buenos Aires on August 11, after a very short illness, of Mr. John Mackintosh, District Traffic Superintendent, Central Argentine Railway. He was born in Inverness-shire in 1882, and received his preliminary training on the old Highland Railway. In 1903 he went to the Cape Government Railways, and occupied various positions on the Western and Eastern Divisions, as well as on the Rhodesia Railways, at that time under the same administration. Mr. Mackintosh entered the service of the Central Argentine Railway in April, 1909, and, after filling various outside posts, was appointed District Traffic Superintendent at Retiro terminus, Buenos Aires, in September, 1926, which position he occupied until his death.

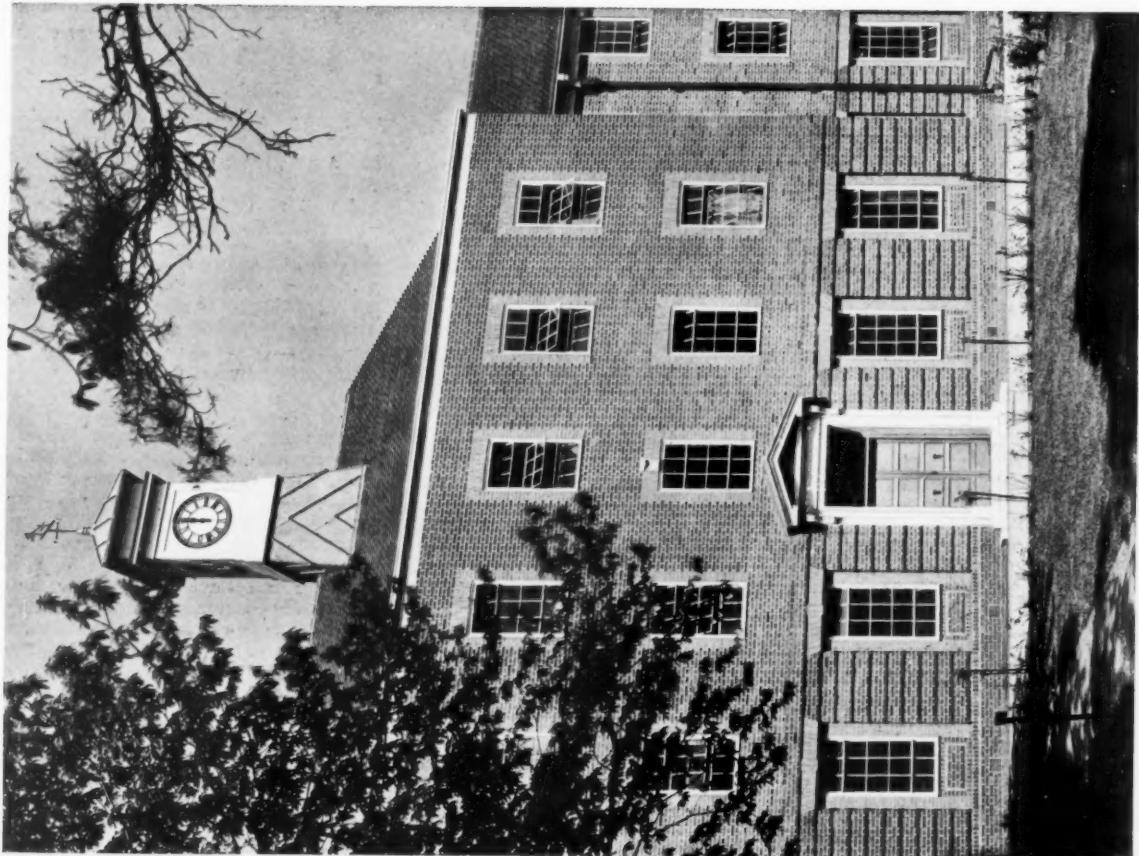
September 11, 1936



German Rhineland sightseeing railcar (see paragraph, August 28)



Redhurst Crossing bridge which, together with 21 others on the abandoned Manifold Valley Light Railway, the L.M.S.R. proposes to dismantle. Strong local protests have been made, as recorded on page 406



The extension to the Southern Railway Servants' Orphanage, Woking, of which the architect was Mr. Stanley C. Liock, F.R.I.B.A. This forms the subject of an editorial note on page 407

De a a sin run 73 (an loc aga and aga are 1,5 158 geth 516 min 633, of t (13, crea capa tons have in 19 in 19 vehic ther of w to figur and own clude wag creas To £53,7 or 2- receipt crease and £38,7 or 3 stand of the in 1924, were per c

Home Railway Returns for 1935

Returns of the capital, traffic, receipts, working expenses, and operating results of the railway companies of Great Britain for the year 1935 have— as indicated in our issue of August 14— been issued by the Ministry of Transport, following on the preliminary statement published in March. The aggregate figures do not now include those of the London Transport railways.

The amount appropriated for the payment of interest and dividends in 1935 was £34,348,660, compared with £33,113,722 in 1934, £30,832,409 in 1933, £28,840,481 in 1932, £35,090,153 in 1931, and £40,366,120 in 1930. These figures represent 3·08 per cent., 2·97 per cent., 2·76 per cent., 2·59 per cent., 3·16 per cent., and 3·64 per cent., respectively, upon the total capital receipts. On ordinary stock issued the average return per cent. was 0·96 in 1935, against 0·86 in 1934, 0·76 in 1933, 0·57 in 1932, 0·95 in 1931, and 2·20 in 1930.

The length of road open for traffic at December 31, 1935, was 20,170 miles, a decrease of 64 miles. Expressed as single track, the total mileage of running lines was 36,866 (a decrease of 73 miles), and of sidings 15,680 miles (an increase of 23 miles). Of traffic locomotives there were 20,328 steam, against 20,543, electric 13 (the same), and petrol, oil, and oil electric 18, against 17. Amongst rail-motor vehicles are included 1,610 electric (against 1,514), and 126 "other" (against 158). Passenger-carrying vehicles together numbered 43,920, a decrease of 516. The number of merchandise and mineral vehicles fell from 636,201 to 633,953, and the total tonnage capacity of these vehicles, excluding brake vans (13,317), was 7,259,760 tons, an increase of 34,850 tons. The average capacity per vehicle rose from 11·60 tons to 11·70 tons. Twelve-ton wagons have increased in numbers from 154,118 in 1925 to 277,628 in 1934 and 294,824 in 1935. Of wagons (other than special vehicles), of 20 tons capacity and over there were 29,634 at the close of 1935, of which 27,138 were allocated specially to mineral traffic. Corresponding figures at the end of 1934 were 29,102 and 26,977 respectively. Private owners' vehicles registered in 1935 included 5,255 12-ton and 42 20-ton coal wagons. Railway-owned containers increased from 10,514 to 11,269.

Total receipts from passengers were £53,753,443, an increase of £1,481,646, or 2·83 per cent. First class ordinary receipts amounted to £3,291,152, an increase of £208,940, or 6·78 per cent., and third class ordinary receipts to £38,798,217, an increase of £1,130,320, or 3 per cent. Passenger journeys at standard fares were only 14·01 per cent. of the total ordinary passenger journeys in 1935, as against 64·97 per cent. in 1924, and the corresponding receipts were 15·40 per cent. in 1935 and 65·59 per cent. in 1924. Third class season

ticket receipts rose from £5,833,732 to £5,964,633, but first class seasons brought in £61,269 less, at £1,554,897. Gross receipts from parcels and miscellaneous passenger train traffic (excluding mails and parcels post) were £12,734,953, a decrease of £90,385, or 0·70 per cent., partly due to reduced rates introduced concurrently with the postal parcels concessions made in July.

The total tonnage of higher class merchandise rose from 45,185,204 tons in 1934 to 45,313,801 tons in 1935. Of minerals and merchandise (Classes 1-6) 50,746,782 tons were conveyed in 1935 against 50,847,917 in 1934, but the weight of coal, coke, and patent fuel rose from 173,987,707 tons to 174,817,089 tons. Excluding free-hauled traffic, the average haul for higher-class merchandise traffic and live stock was 104·52 miles in 1935 compared with 102·86 miles in 1934; but the average receipts per ton-mile was 2·022d. against 2·040d. For minerals and merchandise (Classes 1-6) the average haul rose from 63 miles to 63·83 miles, but the average receipt per ton-mile fell from 1d. to 0·993d. The average haul for coal, coke, and patent fuel rose from 42·03 miles to 42·21 miles, and the average receipt per ton-mile from 1·038d. to 1·039d. The average receipt per ton of merchandise (excluding Classes 1-6) was

BRITISH RAILWAY CAPITAL, 1935

	£
Capital authorised	1,226,514,048
Capital created	1,146,293,207
Capital issued	1,127,079,585
Deduct balance of nominal additions and deductions	44,579,345
Capital issued (excluding nominal additions and deductions)	1,082,500,240
Add balance of premiums and discounts	33,924,286
Deduct calls in arrear and amount uncalled	22,429
Sinking fund debenture stock redeemed	130,000
Total capital receipts	1,116,532,097
Capital expenditure:—	
On railway	1,012,073,912
On road vehicles	3,876,200
On steamboats, &c.	9,378,425
On docks, harbours and wharves	72,394,073
On hotels	9,731,262
On electric power stations, &c.	3,325,205
Subscriptions to companies other than railway	11,619,724
Total capital expenditure	1,180,098,460
Capital expenditure in excess of capital receipts	63,566,363
Total capital powers and other assets available for future expenditure	30,161,679
17s. 6½d. compared with 17s. 5½d. in 1934, per ton of minerals and merchandise (Classes 1-6) 5s. 3½d. compared with 5s. 2½d., and per ton of coal, coke, and patent fuel 3s. 7½d. compared with 3s. 7½d.	

Expenditure on railway working increased by £626,800, but the operating ratio fell from 81·49 per cent. to 80·79 per cent. In traffic expenses there was an increase of £404,213, chiefly in salaries and wages. Locomotive running expenses advanced by £424,970.

TABLE OF REVENUE RECEIPTS AND EXPENDITURE

	Year 1935			Year 1934		
	Gross receipts	Expenditure	Net receipts	Gross receipts	Expenditure	Net receipts
Railway ...	£157,709,932	127,409,818	30,300,114	£155,578,960	126,783,018	28,795,942
Road transport ...	646,579	543,973	102,606	609,620	506,510	103,110
Steamboats ...	3,573,129	3,232,587	340,542	3,450,812	3,191,478	259,334
Canals ...	170,591	220,044	Dr. 49,453	176,559	210,524	Dr. 33,965
Docks, harbours, and wharves ...	6,667,087	6,168,808	498,279	6,593,619	6,068,913	524,706
Hotels, refreshment rooms, and cars...	5,529,258	4,941,029	588,229	5,365,114	4,804,495	560,619
Collection and delivery, parcels and goods ...	4,920,041	5,728,052	Dr. 808,011	4,772,464	5,557,421	Dr. 784,957
Other separate businesses ...	16,733	60,430	Dr. 43,697	13,975	28,992	Dr. 15,017
Total ...	179,233,350	148,304,741	30,928,609	176,561,123	147,151,351	29,409,772
Miscellaneous receipts (net):—						
Rents (houses, lands, hotels, lump sum tolls, &c.) ...	3,577,480					3,558,781
Interest and dividends from investments in other undertakings ...	787,196					712,638
Transfer fees ...	21,353					25,235
General interest ...	911,157					1,072,680
Special items ...	567,171					520,913
Total net receipts ...	36,792,966					35,300,019
Deduct miscellaneous charges (interest on superannuation funds, chief rents, rent charges, rents of leased undertakings, &c.)	3,097,908					3,045,123
Net revenue for the year ...	33,695,058					32,254,896
Balance brought forward from last year's account ...	145,516					185,800
Special items ...	702,850					754,266
Appropriation from general reserve ...	59,500					50,540
Amount available for appropriation ...	34,602,924					33,245,502

September 11, 1936

Anglo-Scottish Winter Train Services, 1936-1937

In the winter timetables, which come into force on September 28, practically the only alteration of note is the striking acceleration of the morning services between London and Scotland. On the L.N.E.R. the down Flying Scotsman is to reach Edinburgh at 5.20 p.m., only 5 min. later than the time at present operating with the non-stop service, and in 7 hr. 20 min. from King's Cross, notwithstanding the usual winter stops at Grantham, York, Newcastle, and Berwick. This overall time is 20 min. less than that of last winter, and 55 min. less than in April, 1932, prior to the May accelerations of that year. The new time will entail covering the 105.5 miles from King's Cross to Grantham in 110 min. (57.5 m.p.h.), and the 82.7 miles thence to York in 83 min. (59.8 m.p.h.), but after that there is a considerable falling off in speed, the 80.1 miles to Newcastle being allowed 90 min., the 66.9 miles thence to Berwick 77 min., and the 57.5 miles from Berwick to Edinburgh 67 min. In the reverse direction, the 10 a.m. from Edinburgh will run through to King's Cross in 7 hr. 25 min., the extra 5 min. being to cover the additional Darlington stop. As in the northbound run, the schedules are very leisurely as far as Darlington—Edinburgh to Berwick in 66 min., and Berwick to Newcastle in 76 min., while from Newcastle to Darlington, 36.0 miles, no less than 49 min. is allowed, so that the average speed from Edinburgh to Darlington, with two stops, is only 48.5 m.p.h. But from there to London an average of 57.1 m.p.h. must be maintained, the 44.1 miles from Darlington to York being run in 45 min., the 82.7 miles thence to Grantham in 86 min., and the 105.5 miles from Grantham to King's Cross in the remarkable time of 107 min., at a start-to-stop speed of 59.2 m.p.h. In this way the London—York time in each direction, inclusive of a stop at Grantham, will be 3½ hr. In connection with the down service, the Aberdeen train will leave Edinburgh at 5.35 p.m. (compared with 6 p.m. last winter), and with no curtailment of running time will be due at 9 p.m., 25 min. earlier, but 32 min. behind the time that has operated during the past summer. As regards other trains, the 1.20 p.m. from King's Cross will continue to run from Newcastle to Edinburgh non-stop in 130 min. for the 124.4 miles (which makes the 146-min. allowance of the Flying Scotsman, including a 2 min. Berwick stop, the more surprising in view of the extremely hard locomotive work which will be necessary with the latter south of York), so reaching Edinburgh in 7 hr. 25 min. from King's Cross, and the 2.5 p.m. from Edinburgh will continue to run to London in 7½ hr., calling only at Grantham between York and London. Other L.N.E.R. alterations include the addition of 3 min. to

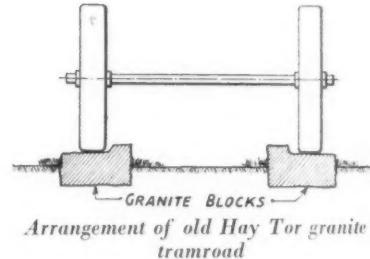
all Edinburgh—Glasgow schedules (presumably to allow of reduced speed over pitfall subsidences,) and several curtailments of a few minutes in the services between Liverpool Street and Cambridge.

On the L.M.S.R. the up Royal Scot is brought down in overall time to 7 hr. 25 min. from both Glasgow and Edinburgh to Euston, this being the fastest time ever yet scheduled between Glasgow and London. As is customary in the winter service, the only intermediate stops are at Symington, where the two sections of the train are joined, and Carlisle; the 66.9 miles from Symington to Carlisle are run in 70 min. (57.3 m.p.h. start-to-stop), and the 299.1 miles from Carlisle to Euston in 5 hr. 21 min., at an average of 55.9 m.p.h. A train alteration contingent on this acceleration is that the up Irish Mail will follow the Royal Scot from Crewe instead of preceding it; the connecting train will leave Dublin (Westland Row) at 8.45 instead

of 8.25 a.m., and the Irish Mail will depart from Holyhead at 12.40 instead of 12.15 p.m., being due in Euston at 5.50 instead of 5.30 p.m. The 82.6 miles from Rugby to Euston will be covered in 84 min., at 59 m.p.h. start-to-stop. Other contingent alterations are that the 9.30 a.m. from Glasgow (St. Enoch) to St. Pancras leaves at 9.25 a.m., to precede the Royal Scot into Carlisle, and waits 10 min. instead of 5 min. at Carlisle; the 9.25 a.m. from Glasgow Central to Liverpool and Manchester also leaves at 9.20 a.m. To the down Royal Scot no alteration is made, and the arrivals of 5.45 p.m. at Glasgow and 5.50 p.m. at Edinburgh, as in the timetables of last spring, are maintained, but the down Midday Scot, temporarily slowed during the summer, reverts to its 116-min. schedule from Carlisle to Glasgow, and once again reaches Glasgow at 9.35 p.m., in 7 hr. 35 min. from Euston. No change is made in the booking of the up Midday Scot, which is still due in Euston at 9.20 p.m. In the north of Scotland the 8.30 a.m. from Inverness to Perth leaves at 8.35 a.m., and picks up 5 min. in running.

Ancient Permanent Way for Science Museum

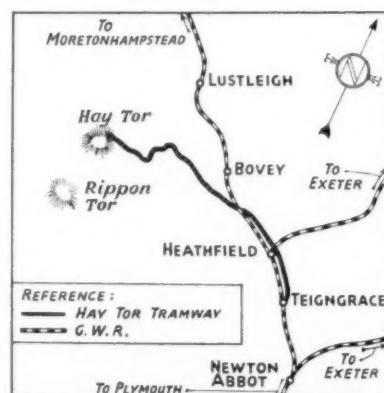
The Science Museum, South Kensington, has recently received as a gift from Mr. D. Jeffreys-Jones one of the stone rails used on the Hay Tor (or Hey Tor) tramroad on Dartmoor. The line was built about 1820 to provide an outlet for the product of a quarry (now disused) at the foot of Hay Tor, whence, more than a century ago, the granite for the construction of London Bridge, the National Gallery, and other public buildings in London was obtained. This 7-mile single-track granite tramroad descended 1,200 ft. to Teigngrace on the Stover canal, where the stone was transhipped into barges. The line was built without Parliamentary powers by a Mr. Templer, then the owner of the quarries, and was opened in September, 1820.



Arrangement of old Hay Tor granite tramroad

The accompanying sketch shows the general arrangement of the tramroad. The stone blocks forming the track were stepped out so as to form a flange on the inside of the flat wagon wheels; the inside distance between the wheels was 4 ft. Near the top of the railway, where lines from two quarries joined, a junction with primitive stone points may still be seen.

In 1829 the quarries and the tramroad passed into the hands of the Duke of Somerset. The tramroad fell into disuse about 1858 and a section of the lower end was used by the Moretonhampstead & South Devon Railway (now part of the G.W.R.) opened on July 4, 1866. This is shown on the accompanying sketch map, but for clarity, the old and new lines are indicated side by side. The G.W.R. acquired the Stover canal in 1876.



Position of the derelict Hay Tor granite tramroad in relation to the Moretonhampstead branch of the G.W.R.

CWMSYFIQ STATION, G.W.R.—At Cwmsyfiog the existing station is to be closed and a new station built by the Great Western Railway on a more central site.

Cumberland Industry

On Thursday, September 3, a press party visited the new by-product coking plant at Workington of the United Steel Companies Limited, as well as the companies' up-to-date blast furnaces and acid Bessemer steel works there, to which reference is made in an editorial article on page 408. The coking plant, which has been designed and erected by the Woodall-Duckham Vertical Retort and Oven Construction Co. (1920) Ltd., of London, recovers from the gas evolved in the ovens valuable by-products in the form of tar, ammonium sulphate, motor fuel, toluole and naphthalene; the sale of these contributes towards lower manufacturing costs of coke, an advantage passed ultimately to the pig-iron and the rails produced therefrom by the acid Bessemer plant. A portion of the gas remaining after by-products removal is used in heating the ovens and for steam raising, whilst the rest is available for use in industry and for domestic purposes. The installation comprises a battery of 53 W-D Becker ovens; coal handling, blending and crushing plant; coke screening and handling plant; by-product recovery plant; and benzole recovery and rectification plant for the production of motor fuel (benzol), toluole and naphtha. Buildings for administrative purposes, mess rooms and welfare accommodation are also included. The ovens are capable of producing 5,000 tons of coke a week from 7,200 tons of coal. The coal is received in railway wagons, which are marshalled on the plant sidings into trains of suitable classes before passing forward to a wagon tipper for discharge into the coal receiving hopper. The sidings are gravity operated and will accommodate 24 hours supply of coal (*i.e.*, eight hours crushing capacity).

The visitors were conducted over the whole plant where they witnessed the processes through which the coke and the gases driven off from it in the ovens are treated, and received the impression that here was an industrial plant second to none for efficiency. Not only is every product of the coal utilised but the whole design of the plant, which incorporates the latest machinery and apparatus, has obviously been laid out with great care and forethought. Wherever men have to work consideration has been paid to their comfort by the provision of congenial and attractive surroundings. That care for the staff is part of the policy of the United Steel Companies received further illustration in a pleasing ceremony which preceded the visit to the works, and consisted in the opening by Mrs. Crichton, wife of the General Manager of the Workington branch of the companies, of a group of cottages for retired employees. In commemoration of the Silver Jubilee of King George V the United Steel Com-

panies Limited presented their employees with a sum of money for the erection of a permanent memorial, and the works council at Workington decided that cottage homes for their retired employees would be the most suitable form of memorial. Mr. W. B. Jones, Chairman of the Companies, who presided over the ceremony and spoke subsequently at a luncheon, said that the activities of the Cumberland

branch of the United Steel Companies extended from just south of Maryport to Egremont. They consisted of collieries, iron-stone mines, limestone quarries, brick works, coke ovens, tar distilleries, iron and steel works, and the largest dock between Barrow and the Clyde. The production and transport of raw materials, which provided traffic for many of the local railway lines, and the manufacture and despatch of finished articles, formed a very substantial contribution to Cumberland industry.

French Railway Posters

The latest series of posters which we have received from the Alsace-Lorraine Railways includes several items of outstanding appeal. While there is no lack of imagination among poster artists in these days, it by no means always expresses itself in such an intelligible or picturesque form as is exemplified in "Retour de Pélérinage," a composition signed by "Hansi." In colouring and line this poster has the delicate detachment from actuality of a fairy tale, and the same picturesque delineation of character. Not only in the faces of the returning pilgrims, but in those of the children gathered round an artist sketching the procession from the steps of the village well, there is a variety and humanity of expression rarely seen in poster populations. In quite another style is "L'Etang de Bischwald," by Julien Lacaze, with its really beautiful rendering of autumnal trees and placid water on a sunny day.

Architectural subjects have inspired several posters, and that illustrating Strasbourg cathedral must be very effec-

tive when displayed. On close inspection, however, the scarlet colour of the spire seems rather startling. The twilight glow in the sky has a very pleasant tranquility, and it seems that a slightly less pronounced contrast between the two predominating colours might have been chosen without loss of power in the whole composition, which is signed by Ernest Schmit. A much more mellow effect is produced by J. de la Nezière in "La Porte de France à Phalsbourg," which has the warm depth of tone and gentle gradation of colouring of a painting in oils. These qualities are generally characteristic of the posters under review, which cover many aspects of scenery in Alsace-Lorraine territory.

We have also received a poster issued jointly by the French railways to advertise important reductions in family tickets. It is a clever combination of a photographic view of a departing train, and a large family, sketched by the artist, hurrying eagerly towards the platform.

Closed Branch Lines—III

Southern Railway

As the Southern Railway system is concerned mainly with passenger traffic, the opportunities for closing branch line services are necessarily fewer than those available to the northern companies.

From the list below it will be seen that under 80 miles have been closed, and in many cases it has been found possible to abandon all rail traffic on unimportant sections.

Section of Line (4 ft. 8½ in. gauge, unless otherwise noted under Remarks)	Passenger Service Withdrawn	Section Completely Closed	Remarks
Dumpton Park (near) to Ramsgate Harbour	—	July 1, 1926	In connection with the Thanet rearrangement of L.C.D.R. and S.E.R. lines
Ramsgate Town to Margate Sands	—	July 1, 1926	—
Canterbury to Whitstable ...	December 31, 1930	September 28, 1935	—
Fort Brockhurst to Lee-on- the-Solent	December 31, 1930	March 31, 1931	—
Hythe to Sandgate ...	—	—	—
Hurstbourne to Fullerton ...	July 5, 1931	—	Track taken up between Hurstbourne and Long- parish in October, 1934
Basingstoke to Alton ...	September 12, 1932	May 30, 1936	Track taken up in Decem- ber, 1916, for war pur- poses; line re-opened August 18, 1924
Brighton to Kemp Town ...	December 31, 1932	—	—
Botley to Bishops Waltham Grogley halt to Ruthern Bridge	December 31, 1932	December 30, 1933	Last trip ran on Novem- ber 29, 1933
Chichester to Midhurst ...	July 6, 1935	—	—
Christchurch to Ringwood ...	—	September 28, 1935	—
Lynton to Barnstaple ...	—	September 29, 1935	1 ft. 11½ in. gauge

NOTES AND NEWS

Italian Railway Electrification.—It is officially announced that a sum of 1,200,000,000 lire (£18,593,000 at current rates) has been authorised for further electrification of the Italian State Railways.

G.W.R. Water Trough Filling.—The steam pumping plant at Chard and the oil-driven pumping plants at Thame and Westbury, which fill the water troughs, are to be converted by the G.W.R. to electric operation.

New L.M.S.R. Tilbury Line Halt.—A new halt at East Tilbury, between Low Street and Stanford-le-Hope stations on the Tilbury-Southend line of the L.M.S.R., was opened for passengers, parcels, and miscellaneous traffic on Monday, September 7.

Basle Station Re-naming.—Of the two main railway stations at Basle, the Swiss Federal is on the left bank of the Rhine and the German on the right bank. The German station was formerly known as the Badischer Bahnhof, and subsequently designated Basel Reichsbahnhof; this name has now been changed officially to Basel D.R.B. (Basel Deutsche Reichsbahn).

French Railcar Run on Wood Gas.—On the Bordeaux to Saint Symphorien line, not far from the Landes forest, which has very large quantities of pine trees, a railcar using wood gas has been placed in public service. The railcar, which is 9.80 m. long, is driven by a six-cylinder engine of 21 h.p. and is capable of a normal speed of 70 km.p.h. and a maximum of 85 km.p.h. It burns 75 kg. of wood cut into pieces of 10 cm. long by 5 cm. square. Fuel consumption costs are stated to be only a sixth of those of the petrol that is replaced.

Transport Classes in Birmingham.—The new term of the City of Birmingham Commercial College opens on September 21, and evening classes will be held in transport subjects for the following examinations: London University degrees in transport; Institute of Transport graduation and associate membership; Royal Society of Arts diploma in road transport. The college has its own diploma in industrial transport management, holders of which are exempted from the associateship examination of the Industrial Transport Association.

An American Printing Exhibition Train.—The American Type Founders, and 14 associated companies, are sponsoring an exhibition train—the Printers Progress Special—which will leave Grand Central terminal, New York, on September 14 for a 100-day tour of 71 cities. The train will consist of four cars, three exhibition cars, and another which will be used as offices and living quarters for the crew of 14. The cars will be painted red, white, and blue with aluminium tops. The exhibit will consist of a printing plant with all acces-

sories, showing the progress of a complete printing job from manuscript to finished article.

German Ten-Coupled Tank Locomotive.—The Borsig Locomotive Works has built for the German State Railway a 2-10-2 tank locomotive weighing 134 tons, and which has a tractive effort of 66,000 lb. and a hauling capacity of 1,700 tons up a 1 in 125 grade at 15 m.p.h.

German Eight-Coupled Locomotives.—The German State Railway is to order some two-cylinder 4-8-4 tank engines for the operation of passenger and light fast goods trains. The adhesion weight will be about 60 tonnes, the boiler pressure 290 lb. per sq. in., and the top speed 56 m.p.h. The engines will be classified as Reihe 71.

Southdown Motor Services Limited.—The nominal capital of this company has been increased from £426,250 (by £323,750) to £750,000. This year marks the coming-of-age of the company, for it was incorporated on June 2, 1915, to amalgamate various bus undertakings working on the Sussex coast.

Jubilee of Jungfrau Railway.—The 40th anniversary of the date on which construction of the Jungfrau Railway was begun is to be celebrated this year. Work was carried out at several different periods, owing to the serious difficulties encountered when working at such great altitudes. The whole line up to the Jungfraujoch (3,457 metres) was completed in 1912.

Italian Royal Coach for Abyssinia.—A Press message from Rome states that an Italian Royal visit and "Imperial Coronation" ceremonies in Addis Ababa next year are foreshadowed by a recent order for three special State railway coaches for tropical use; work on them has been begun already. These saloon coaches are for the Djibouti to Addis Ababa line, and are respectively for the King of Italy, Signor Mussolini, and Marshal Graziani.

Simplon Line Flooded in Storm.—In the night of September 3-4 the Simplon line was blocked by the overflowing, due to a heavy storm, of the Mauvoisin, a mountain torrent entering the Rhone near St. Maurice. The Simplon-Orient Express and other international trains were routed via Berne and the Lötschberg line, and local passengers were conveyed by road between St. Maurice and Evionnaz. Traffic was resumed on Saturday morning, September 5, on one track. Another mountain stream in the same district, the St. Barthélémy, caused prolonged interruption of traffic on the Simplon route in 1926, 1927, and 1930 by covering the line with rocks and mud for some distance. Extensive protection works were subsequently undertaken by the Swiss

Federal Railways to prevent the recurrence of such events. Both torrents come from the Dents du Midi, in the Valais Alps.

Mont Revard Railway.—The cog-wheel railway from Aix-les-Bains to the little resort of Mont Revard has now been replaced by a cable railway, which maintains a service at frequent intervals from 8 a.m. to 10 p.m. daily. The journey lasts 12 minutes up or down. There is also a connecting motorbus service from the P.L.M. station to the lower station of the cable railway. Situated at an altitude of 5,070 ft. on a wide plateau near the summit of the Revard, the resort offers notable views.

Air Crash on L.M.S.R. Main Line.—On Wednesday, an R.A.F. aeroplane crashed on the embankment of the L.M.S.R. main line at Madeley, 10 miles from Crewe, and, after turning a somersault, came to rest a few inches from the up Mancunian, which was passing. The pilot was unhurt. The look-out man of a gang working nearby warned another approaching train by fog signals, and the driver of the Mancunian signalled with his whistle to a train coming in the opposite direction to stop. The slow lines, on which the machine fell, were blocked for an hour.

A U.S.A. "Soil Improvement" Car.—A "soil improvement" car operated jointly by the Nashville, Chattanooga & St. Louis Railroad and the Agricultural Extension Service of the University of Tennessee has recently been making a two-week tour of N.C. & St. L. lines. All counties in Tennessee served by this railroad were visited where sufficient interest was manifested by the farmers and other interested parties. The car is equipped to test samples of soil for lime and phosphate needs. Those in charge offer advice to farmers regarding the need of lime and phosphate on their lands.

Standard Colours for Brighter L.M.S.R. Stations.—The L.M.S.R. has adopted six standard colours to be used for repainting its 2,500 passenger stations on brighter lines than heretofore. These colours comprise two light shades (deep cream or Portland stone), either of which can be used in conjunction with any three dark shades (middle brown, middle Brunswick green, or Venetian red). The sixth colour, golden brown, can be used alone or in combination with others, and withstands the effects of a rust-like stain caused by iron dust in the air, peculiar to areas of electric traction. Ultimately, all L.M.S.R. stations will be repainted in selected combinations of the new colours.

Royal Society of Arts Road Transport Examinations.—Last year the Royal Society of Arts was approached by a special committee, representative of road transport operators, the Institute of Transport, and the various interested universities and technical colleges, to initiate a national scheme of education in road transport subjects for those

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engaged in the industry who were not in a position to take the examinations for graduate and associate membership of the Institute of Transport. In response to this request the Royal Society of Arts drew up a three years' course in connection with which a diploma in road transport was instituted. The scheme was put into immediate operation last autumn and the response was most encouraging, 1,014 papers being worked at the examinations held in May last. Arrangements have now been completed with the local educational authorities for providing suitable classes for the forthcoming winter. The syllabus of examinations may be obtained from the Royal Society of Arts.

"Air Shopping" in the U.S.A.—A new feature in American transport is an air express service bringing to women in all parts of the country rare foods and flowers and the latest fashions, within a maximum of a few hours. The new service, requiring only an order by telephone to the order department of the Railway Express Agency, is designed to enable the housewife and hostess to

place upon her table within a few hours foods and flowers flown from their sources in Canada, the United States, and Central America. "Fruits ordered direct from Florida," an official statement says, "will appear upon the breakfast table the next morning. Centennial roses ordered from Texas in the morning may appear upon the dinner table the same night. And a Paris model, ordered from Fifth Avenue one day, will be worn in Seattle the next."

Road Accidents.—The Ministry of Transport return for the week ended September 5 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year:—

	Killed, including deaths resulting from previous accidents		Injured	
England	101	(119)	4,449	(4,255)
Wales	4	(8)	190	(213)
Scotland	14	(20)	417	(445)
	119	(147)	5,056	(4,913)

The total fatalities for the previous week were 147, compared with 124 for the corresponding period of last year.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 36th Week,			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
L.M.S.R. (6,916 $\frac{1}{2}$ mls.)						
Passenger-train traffic...	593,000	554,000	+ 39,000	18,305,000	18,010,000	+ 295,000
Merchandise, &c.	493,000	468,000	+ 25,000	16,878,000	15,929,000	+ 949,000
Coal and coke	229,000	232,000	- 3,000	8,558,000	8,134,000	+ 424,000
Goods-train traffic	722,000	700,000	+ 22,000	25,436,000	24,063,000	+ 1,373,000
Total receipts ...	1,315,000	1,254,000	+ 61,000	43,741,000	42,073,000	+ 1,668,000
L.N.E.R. (6,332 mls.)						
Passenger-train traffic...	394,000	349,000	+ 45,000	11,893,000	11,714,000	+ 179,000
Merchandise, &c.	322,000	286,000	+ 36,000	11,472,000	11,023,000	+ 449,000
Coal and coke	224,000	211,000	+ 13,000	8,263,000	7,847,000	+ 416,000
Goods-train traffic	546,000	497,000	+ 49,000	19,735,000	18,870,000	+ 865,000
Total receipts ...	940,000	846,000	+ 94,000	31,628,000	30,584,000	+ 1,044,000
G.W.R. (3,746 $\frac{1}{2}$ mls.)						
Passenger-train traffic...	261,000	245,000	+ 16,000	7,729,000	7,656,000	+ 73,000
Merchandise, &c.	199,000	186,000	+ 13,000	6,735,000	6,452,000	+ 283,000
Coal and coke	98,000	94,000	+ 4,000	3,581,000	3,513,000	+ 68,000
Goods-train traffic	297,000	280,000	+ 17,000	10,316,000	9,965,000	+ 351,000
Total receipts ...	558,000	525,000	+ 33,000	18,045,000	17,621,000	+ 424,000
S.R. (2,153 mls.)						
Passenger-train traffic...	383,000	359,000	+ 24,000	11,311,000	11,183,000	+ 128,000
Merchandise, &c.	65,500	55,500	+ 10,000	2,221,000	2,195,500	+ 25,500
Coal and coke	28,500	21,500	+ 7,000	1,108,000	1,049,500	+ 58,500
Goods-train traffic	94,000	77,000	+ 17,000	3,329,000	3,245,000	+ 84,000
Total receipts ...	477,000	436,000	+ 41,000	14,640,000	14,428,000	+ 212,000
Liverpool Overhead ... (61 mls.)	1,220	1,315	- 95	43,214	43,134	+ 80
Mersey (4 $\frac{1}{2}$ mls.)	4,197	4,075	+ 122	144,547	143,466	+ 1,081
*London Passenger Transport Board	557,200	532,200	+ 25,000	5,533,900	5,365,000	+ 168,900
IRELAND						
Belfast & C.D. pass. (80 mls.)	4,083	3,244	+ 839	97,213	96,329	+ 884
" " goods	525	470	+ 55	19,554	17,893	+ 1,661
" " total	4,608	3,714	+ 894	116,767	114,222	+ 2,545
Great Northern pass. (543 mls.)	17,200	15,650	+ 1,550	390,000	376,350	+ 13,650
" " goods	9,500	9,650	- 150	332,250	323,050	+ 9,200
" " total	26,700	25,300	+ 1,400	722,250	699,400	+ 22,850
Great Southern pass. (2,067 mls.)	52,563	52,411	+ 152	1,293,919	1,273,307	+ 20,612
" " goods	44,339	39,930	+ 4,409	1,422,287	1,319,457	+ 102,830
" " total	96,902	92,341	+ 4,561	2,716,206	2,592,764	+ 123,442

* 10th week.

† 35th week.

British and Irish Railways Stocks and Shares

Stocks	Highest 1935	Lowest 1935	Prices	
			Sept. 9, 1936	Rise/Fall
G.W.R.				
Cons. Ord.	55 $\frac{1}{2}$	44 $\frac{1}{2}$	52	+ 1 $\frac{1}{2}$
5% Con. Prefe.	124	108	120 $\frac{1}{2}$	—
5% Red. Pref. (1950)	117	106 $\frac{3}{4}$	109 $\frac{1}{2}$	—
4% Deb.	118 $\frac{1}{2}$	108	115 $\frac{1}{2}$	+ 1 $\frac{1}{2}$
4 $\frac{1}{2}$ Deb.	122	110	117 $\frac{1}{2}$	—
4 $\frac{1}{2}$ Deb.	129 $\frac{1}{2}$	118	125	—
5% Deb.	140 $\frac{1}{4}$	130	136 $\frac{1}{2}$	—
2 $\frac{1}{2}$ Deb.	82 $\frac{1}{4}$	68 $\frac{1}{2}$	76	—
5% Rt. Charge	137	128	134 $\frac{1}{2}$	—
5% Cons. Guar.	136 $\frac{3}{4}$	120 $\frac{1}{2}$	131	—
L.M.S.R.				
Ord.	25 $\frac{5}{8}$	16	28	—
4% Prefe. (1923)	58 $\frac{1}{4}$	43 $\frac{1}{2}$	77 $\frac{1}{2}$	+ 1 $\frac{1}{2}$
4% Prefe.	87 $\frac{1}{2}$	73 $\frac{1}{2}$	87 $\frac{1}{2}$	+ 1 $\frac{1}{2}$
5% Red. Pref. (1955)	107	97 $\frac{3}{4}$	107	+ 1 $\frac{1}{2}$
4% Deb.	110 $\frac{1}{4}$	99 $\frac{1}{2}$	107 $\frac{1}{2}$	+ 1 $\frac{1}{2}$
5% Red. Deb. (1952)	119 $\frac{11}{16}$	111 $\frac{5}{8}$	117	+ 1 $\frac{1}{2}$
4 $\frac{1}{2}$ Sinking Fund Deb.	112 $\frac{1}{2}$	108	109	—
L.N.E.R.				
5% Pref. Ord.	157 $\frac{1}{2}$	81 $\frac{1}{4}$	14	+ 1 $\frac{1}{2}$
Def. Ord.	79 $\frac{1}{2}$	48 $\frac{1}{2}$	63 $\frac{1}{2}$	—
4% First Prefe.	74 $\frac{1}{2}$	48	76	+ 1
4% Second Prefe.	31 $\frac{1}{2}$	16 $\frac{1}{4}$	30 $\frac{1}{2}$	+ 1 $\frac{1}{2}$
5% Red. Pref. (1955)	92 $\frac{1}{4}$	71	96 $\frac{1}{2}$	—
4% First Guar.	103 $\frac{11}{16}$	93	101	—
4% Second Guar.	98 $\frac{1}{4}$	82 $\frac{1}{2}$	96	+ 1
3 $\frac{1}{2}$ Deb.	86	75	82	—
4 $\frac{1}{2}$ Deb.	109 $\frac{1}{4}$	98 $\frac{1}{2}$	106	—
5 $\frac{1}{2}$ Red. Deb. (1947)	118 $\frac{1}{4}$	106 $\frac{1}{2}$	111 $\frac{1}{2}$	—
4 $\frac{1}{2}$ Sinking Fund				
Red. Deb.	112 $\frac{1}{2}$	108	109	—
SOUTHERN				
Pref. Ord.	87 $\frac{1}{2}$	69 $\frac{1}{2}$	92	—
Def. Ord.	25 $\frac{15}{16}$	16 $\frac{1}{4}$	23	—
5% Prefe.	124	108 $\frac{1}{4}$	120 $\frac{1}{2}$	—
5% Red. Pref. (1964)	117 $\frac{1}{4}$	109 $\frac{1}{2}$	116 $\frac{1}{2}$	—
5% Guar. Prefe.	136 $\frac{1}{2}$	121 $\frac{1}{2}$	131 $\frac{1}{2}$	—
5% Red. Guar. Pref.	121 $\frac{1}{4}$	112 $\frac{1}{2}$	117 $\frac{1}{2}$	—
(1957)				
4 $\frac{1}{2}$ Deb.	116 $\frac{3}{4}$	107	114	—
5 $\frac{1}{2}$ Deb.	138	130 $\frac{1}{4}$	135 $\frac{1}{2}$	—
4 $\frac{1}{2}$ Red. Deb.	115	106 $\frac{1}{2}$	111 $\frac{1}{2}$	—
1962-67				
BELFAST & C.D.				
Ord.	9	4	5	—
G. NORTHERN (IRELAND)				
Ord.	20	7	14 $\frac{1}{2}$	—
G. SOUTHERN (IRELAND)				
Ord.	57 $\frac{1}{2}$	14 $\frac{1}{2}$	58	—
Prefe.	50	25 $\frac{1}{4}$	62 $\frac{1}{2}$	+ 1 $\frac{1}{2}$
Guar.	88 $\frac{1}{4}$	51 $\frac{1}{4}$	89 $\frac{1}{4}$	—
Deb.	86 $\frac{1}{4}$	70	94	—
L.P.T.B.				
4 $\frac{1}{2}$ "A"	130	119 $\frac{5}{8}$	123 $\frac{1}{2}$	+ 1
5% "A"	139 $\frac{1}{4}$	130	134 $\frac{1}{2}$	—
4 $\frac{1}{2}$ "T.F.A."	113 $\frac{1}{4}$	108	109	—
5 $\frac{1}{2}$ "B"	131 $\frac{1}{2}$	122 $\frac{1}{2}$	128 $\frac{1}{2}$	—
"C"	109 $\frac{1}{2}$	91	107	+ 1
MERSEY				
Ord.	231 $\frac{1}{2}$	91 $\frac{1}{4}$	29	+ 2
4 $\frac{1}{2}$ Perp. Deb.	100 $\frac{1}{2}$	93 $\frac{1}{2}$	99	—
3 $\frac{1}{2}$ Perp. Deb.	75 $\frac{1}{2}$	67	74 $\frac{1}{2}$	—
3 $\frac{1}{2}$ Perp. Prefe.	62	47 $\frac{1}{4}$	65 $\frac{1}{2}$	+ 1

September 11, 1936

LEGAL AND OFFICIAL NOTICES

*In the Court of the Railway Rates Tribunal.***Road and Rail Traffic Act, 1933**
Agreed Charges**NOTICE IS HEREBY GIVEN** that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of

which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The Procedure to be followed in regard to the inspection of the said Applications and the filing of Notices of Objections is that published in the "London Gazette" of 28th July, 1936.

Printed copies of the Procedure can be obtained from the Office of the Tribunal, Bush House, Aldwych, London, W.C.2.

Notices of Objection to any of the said

Applications must be filed on or before the 2nd day of October, 1936.

A copy of each Application can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price is. post free.

T. J. D. ATKINSON,

Registrar.

9th September, 1936.

Number of Application	Name of Trader and General Description of Traffic	Number of Application	Name of Trader and General Description of Traffic
1936— No. 369	R. SALISBURY, 218, Broad Street, Birmingham; Live Pigs. <i>This Application relates also to Agreed Charges with four other Traders in Great Britain as specified therein for the same traffic.</i>	1936— No. 410	RUDKIN LAUNDON & CO. LTD., 346, St. Saviours Road, Leicester; Hosiery and Knitted Wear.
1936— No. 370	FOWLER BROS. LTD., 40, St. Martin's-le-Grand, London, E.C.1; Confectionery, Groceries and Provisions, &c.	1936— No. 411	F. SHAPIRA & CO. LTD., 12, Commercial Street, London, E.1; Ladies' Outwear.
1936— No. 371	E. E. JEWELL, 1,450, Pershore Road, Stretford, Birmingham; Live Pigs. <i>This Application relates also to Agreed Charges with four other Traders in Great Britain as specified therein for the same traffic.</i>	1936— No. 412	WESTWARDS LIMITED, 122, Victoria Street, Bristol, 1; Books, Stationery, Toys and Fancy Goods.
1936— No. 372	LEESINGS, 17, Baxter Gate, Doncaster; Live Pigs.	1936— No. 413	DUKES (YORK) (1935) LIMITED, 1, Leeman Road, York; Dyed and Cleaned Goods.
1936— No. 373	A. J. BALCOMBE LIMITED, 52-58, Tabernacle Street, London, E.C.2; Gramophones, Wireless Sets, Refrigerators, &c.	1936— No. 414	H. SAMUEL LIMITED, Hunter Road Works, Hockley, Birmingham, 10; Clocks, Cutlery, Plates and Fancy Goods and Glassware.
1936— No. 374	W. & G. BROWN, Lodge Lane, Derby; Barley Kernels.	1936— No. 415	<i>Applicable also to traffic consigned by five Associated or Subsidiary Companies.</i>
1936— No. 375	H. H. & S. BUDGETT & CO. LTD., Nelson Street, Bristol; Groceries, Provisions, Confectionery, Wines, Electrical Stores, &c.	1936— No. 416	FREDERICK WILLIAM RILEY, carrying on business under the style of F. W. RILEY & SON, Trent Road, Longton; Live Pigs. <i>This Application relates also to Agreed Charges with two other Traders in Great Britain as specified therein for the same traffic.</i>
1936— No. 376	M. BYWATER & CO. LTD., 376, Coventry Road, Small Heath, Birmingham, 10; Preserved Provisions, &c.	1936— No. 417	FABRAM LIMITED, Station Works, Halifax; Motor Car and Cycling Equipment and Accessories.
1936— No. 377	CLAYTON MAYERS & CO. LTD., North Circular Road, London, N.W.2; Glassware.	1936— No. 418	THE METTOY CO. LTD., 70, Finsbury Pavement, London, E.C.2; Toys.
1936— No. 378	HUDSON & WRIGHT LIMITED, Grove Street, Birmingham, 18; Brass and Copper Tubes.	1936— No. 419	JOSEPH ARMITAGE, SON & CO. LTD., 5, Minories, London, E.C.3; Tea, Coffee, China and Earthenware.
1936— No. 379	MALETT, PORTER & DOWD LIMITED, 465, Caledonian Road, London, N.7; Clothing and Blankets.	1936— No. 420	ELLIOTTS OF NEWBURY LIMITED, Albert Works, Newbury; Chairs.
1936— No. 380	MINIMAX LIMITED, Feltham, Middlesex; Fire Extinguishers and Refills.	1936— No. 421	FULLER'S LIMITED, Hammersmith, London, W.6; Confectionery, &c.
1936— No. 381	RUDKIN LAUNDON & CO. LTD., 346, St. Saviours Road, Leicester; Hosiery and Knitted Wear.	1936— No. 422	THOS. GUEST & CO. LTD., Carruthers Street, Ancoats, Manchester, 1; Pharmaceutical Products.
1936— No. 382	TEETGEN & CO. LTD., Teetgen's Warehouse, New Street, Bishopton, London, E.C.2; Confectionery, Groceries, Provisions, Wines, &c.	1936— No. 423	T. W. HUDSON & SONS, 11, Wharf Street, Stockton-on-Tees; Joinery Work. <i>Applicable also to traffic consigned by one Associated or Subsidiary Company.</i>
1936— No. 383	WHITEWAYS CYDER CO. LTD., 38/46, Albert Embankment, London, S.E.1; Cider, British Wines, &c.	1936— No. 424	PASHON PRODUCTS LIMITED, Trading Estate, Slough; Cordials and Preserves.
1936— No. 384	WORLDWIDE WHOLESALE WAREHOUSE, Charles Street, Manchester, 1; Furniture and Household Requisites.	1936— No. 425	THE RYBURNDALE PAPER MILLS CO. LTD., Rippenden, near Halifax; Paper.
1936— No. 385	GEORGE BRETTLE & CO. LTD., 119, Wood Street, London, E.C.2; Cotton, Woollen and Silk Goods, Hosiery, &c.	1936— No. 426	M. SAPER LIMITED, Argall Avenue, Le Bridge Factory Estate, London, E.10; Confectionery and Sugar.
1936— No. 386	THE MANCHESTER MUTUAL TRADING ASSN. LIMITED, 36, Granby Row, Manchester; General Household Requisites.	1936— No. 427	SKINETOLIN CO. LTD., 13, Kirkwood Road, London, N.W.1; Drugs, Hairdressers' Sundries and Perfumery.
1936— No. 387	OXENDALE & CO. LTD., Granby House, Granby Row, Manchester; General Household Requisites.	1936— No. 428	<i>Applicable also to traffic consigned by one Associated or Subsidiary Company.</i>
1936— No. 388	ARIEL MOTORS (J.S.) LIMITED, Ariel Works, Selly Oak, Birmingham; Motor Bicycles.	1936— No. 429	WIGGINS, TEAPE & ALEX. PIRIE (SALES) LIMITED, 46/58, Mamill Street, Aldgate, London, E.1; Paper.
1936— No. 389	BRAITHWAITE'S, 12, Embledon Street, Liverpool; Cooked Meats, &c.	1936— No. 430	YEATMAN & CO. LTD., Denmark Street, London, E.1; Groceries, Provisions, Confectionery, British Wines, &c.
1936— No. 390	COSS & MORRIS LIMITED, Shannon Street Mills, Leeds, 9; Clothing and Raincoats.	1936— No. 431	<i>Applicable also to traffic consigned by one Associated or Subsidiary Company.</i>
1936— No. 391	F. HODGSON & SONS, Woodsley Road, Leeds; Blankets, Carpets, Drapery, Household Linen, &c.	1936— No. 432	JAMES D. BENNET LIMITED, 36-40, Tenant Street, St. Rollox, Glasgow, G.4; Furniture, Paint.
1936— No. 392	E. C. MIDGLEY & SONS LTD., Black Prince House, Wellington Street, Leeds, 1; Boots and Shoes.	1936— No. 433	HENRY BRUCE & SONS LTD., Kinleith Mill, Currie, Midlothian; Paper.
1936— No. 393	E. MILES & CO., The Bacon Factory, West Street, Bristol, 2; Bacon, Cheese, Meat, &c.	1936— No. 434	THE FREEDER CREPE PAPER MILLS LIMITED, Lea Bridge Road, London, E.10; Paper and Paper Articles.
1936— No. 394	THOMAS RATCLIFFE & CO. LTD., Albert Mills, Mytholmroyd; Blankets.	1936— No. 435	J. HEPWORTH & SON LTD., Leeds, 2; Clothing, Hats, Drapery and Paper.
1936— No. 395	A. RIDDELL & CO. LTD., East Parade, Bradford, Yorks; Costumes, &c.	1936— No. 436	MAIGA (LONDON) LIMITED, Southall, Middlesex; Confectionery and Fondant Sugar.
1936— No. 396	PAUL WALSER & CO. LTD., Reslaw House, Great Marlborough Street, London, W.1; Hats, Millinery, &c.	1936— No. 437	MARS CONFECTIONS LIMITED, Trading Estate, Slough; Confectionery.
1936— No. 397	WORLDWIDE WHOLESALE WAREHOUSES, Charles Street, Manchester, 1; Clothing, Drapery and General Stores Wares.	1936— No. 438	MUNDUS AND J. & J. KOHN LIMITED, 50, Great Eastern Street, London, E.C.2; Bentwood Furniture.
1936— No. 398	GEORGE BRETTLE & CO. LTD., 119, Wood Street, London, E.C.2; Gloves, Hosiery, Textiles, &c.	1936— No. 439	<i>Applicable also to traffic consigned by one Associated or Subsidiary Company.</i>
1936— No. 399	THE CELLULAR CLOTHING CO. LTD., 72 and 73, Fore Street, London, E.C.2; Shirts and Underwear.	1936— No. 440	PURNELL'S FOOD PRODUCTS LIMITED, 16a, Meadow Street, Bristol; Preserves, Pickles and Sauces, Advertising Matter, &c.
1936— No. 400	WILKINSON & WARBURTON LIMITED, Careesa House, King Street, Leeds, 1; Clothing and Textiles.	1936— No. 441	T. ROBERTS & SONS LTD., Portland Shoe Works, Leicester; Boots and Shoes.
1936— No. 401	WM. COLLINS, SONS & CO. LTD., 144, Cathedral Street, Glasgow, C.4; Books and Stationery.	1936— No. 442	SPRING & CO. LTD., Brigg, Lincolnshire; Bottled and Canned Fruit, Jam, Fruits, Cordials, British Wines, &c.
1936— No. 402	PETER KEEVIL & SONS LTD., 370, Edgware Road, London, W.2; Groceries, Preserves and Provisions, &c.	1936— No. 443	WAKELEY BROS. & CO. LTD., Honduras Wharf, Bankside, London, S.E.1; Agricultural and Garden Seeds and Bulbs, Garden Ornaments, &c., Agricultural Drainpipes, Cement, Manure, Sand, &c.
1936— No. 403	D. WHITTLE & SONS, 12, Bridge Street, St. Helens, Lancaster; Live Pigs.	1936— No. 444	PURSERS LIMITED, 16, Church Road, Thame, Oxon; Clothing, Drapery and General Stores Wares.
1936— No. 404	<i>This Application relates also to Agreed Charges with two other Traders in Great Britain as specified therein for the same traffic.</i>	1936— No. 445	JOHN C. GYNN, "Treslay," Boscastle, Cornwall; Rabbits (dead).
1936— No. 405	H.M. OFFICE OF WORKS, SUPPLIES DIVISION, King Charles Street, Whitehall, London, S.W.1; Furniture and General Stores.	1936— No. 446	T. ROBERTS & SONS LTD., Portland Shoe Works, Leicester; Boots, Shoes and Advertising Matter.
1936— No. 406	THE IMPERIAL TOBACCO CO. (OF GREAT BRITAIN AND IRELAND) LTD., East Street, Bedminster, Bristol; Cigarettes and Tobacco.	1936— No. 447	THE CALOR-GAS (DISTRIBUTING) CO. LTD., 17/18, Margaret Street, London, W.1; Butane Gas.
1936— No. 407	ALBERT E. JONES (LONGTON) LIMITED, Palissy Pottery, Longton, Stoke-on-Trent; Earthenware (packages under 28 lb.).	1936— No. 448	THE ENFIELD CYCLE CO. LTD., Enfield Works, Redditch; Bicycles, Motor Cycles, Motor Mowers, Cycle Parts and Accessories, &c.
1936— No. 408	ALBERT E. JONES (LONGTON) LIMITED, Palissy Pottery, Longton, Stoke-on-Trent; Earthenware (packages over 28 lb.).	1936— No. 449	PANNETT & NEDEN, 206/208, Stewarts Road, London, S.W.8; Bulbs, Seeds, Florists' Sundries, Toilet Sundries, &c.
1936— No. 409	T. A. & E. PEMBERTON, Blossom Street, Ancoats, Manchester; Old Periodicals.	1936— No. 450	THE SOUTHERN OIL CO. LTD., Trafalgar Park, Manchester, 17; Edible Oils and Lard Compound.
1936— No. 410	REA VALLEY FOODS LIMITED, 8, Harrington Street, Liverpool, 2; Tinned Fruits, Preserved Hams.		

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Legal and Official Notices—continued

OFFICIAL ADVERTISEMENTS.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

University of London Commerce Degree Bureau

THE Official Institution of the University for the assistance of External Students preparing for the Commerce Degree Examinations of the University of London who are unable to attend regular College Lectures. For Prospectus apply to Secretary (Mr. H. J. Crawford, B.A.), 46, Russell Square, London, W.1.

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33, Tothill Street, London, S.W.1.

CONTRACTS AND TENDERS

Rolling Stock for India

P. & W. MacLellan Limited has received an order from the Bengal Iron Company for six special type, 5 ft. 6 in. gauge, hopper wagons.

The Bhavnagar State Railway Administration has placed the following orders for a total of 50 wagons, to be supplied to the inspection of Messrs. Robt. White & Partners: Gregg Car Company, 40 four-wheeled metre-gauge I.R.C.A. MC4 type, modified, open wagons; and Nicaise et Delcuve, 10 metre-gauge bogie tank wagons, I.R.C.A. MBDI type, modified.

Nicaise et Delcuve has also received orders from the Morvi Railway Administration, to the inspection of Messrs. Robt. White & Partners, for three 60 ft. bogie carriage underframes with I.R.C.A. bogies and four four-wheeled I.R.C.A. carriage bogies, metre gauge.

Ateliers de Construction Familiureux has received an order from the Junagadh State Railway for six metre-gauge four-wheeled carriage underframes 22 ft. 9 in. long, to be supplied to the inspection of Messrs. Robt. White & Partners.

Nasmyth Wilson & Co. Ltd. has received an order from the Madras & Southern Mahratta Railway for six locomotive cylinders to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

Locomotive Grease Lubricating Equipment Orders

Whitelegg & Rogers Limited has received orders for Ajax grease lubricating equipment for 40 Class 19C locomotives, now under construction by Fried. Krupp A.G., for the South African Railways; for 10 XT Class locomotives building by Fried. Krupp A.G. for the East Indian Railway; for 5 YB Class locomotives being constructed by Robert Stephenson & Co. Ltd., for the Madras and Southern Mahratta Railway; and for one passenger locomotive and tender building by Beyer, Peacock & Co. Ltd., for the Peruvian Corporation Limited.

Henry Broadbent Limited has received an order from the Chinese Government Purchasing Commission for two heavy duty lathes required for the Canton-Hankow Railway and to be supplied to the inspection of Messrs. Fox & Mayo.

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received orders

from the Chinese Government Purchasing Commission for quantities of A.R.A. type D automatic couplers and wagon spares for the Canton-Hankow Railway, to be supplied to the inspection of Messrs. Fox & Mayo.

L.M.S.R. Steamer Orders

The Fairfield Shipbuilding & Engineering Co. Ltd. has received orders from the L.M.S.R. for two paddle steamers for service on the Clyde. These steamers will each have an overall length of 230 ft., moulded breadth 30 ft., and a speed of 17½ knots. Each will have accommodation for 1,200 passengers.

Antifriction Bearing Orders

British Timken Limited has received orders for Timken bearings required for 12 Class 15E 4-8-2 type steam locomotives under construction by Henschel & Sohn A.G., for the South African Railways. The bearings are to be fitted to the leading bogies, trailing trucks and tenders. This application represents the first large-scale use of Timken bearings to locomotives in South Africa, and follows the success of the Timken bearings fitted experimentally to the leading bogie and trailing truck of one Class 19C passenger engine placed in service about a year ago. The Timken bearings are housed in cannon boxes, CB type, on the leading bogie, TSB type boxes on the trailing truck, and DF type on the tenders, these being of the double bogie type with equaliser beams. The engines are intended for working both heavy passenger and freight trains.

P. & W. MacLellan Limited has received orders for 31 tons of steel bars and sections for the South Indian Railway to be supplied to the inspection of Messrs. Robt. White & Partners.

Leyland Motors Limited has received the following orders from railway-associated road transport operators: Ribble Motor Services Limited, 24 oil-engined Titans; and Thames Valley Traction Co. Ltd., two Cub vehicles.

Steelwork Required for South Africa

The South African Railways & Harbours Administration is calling for tenders (Contract No. 1027) for the supply and delivery f.o.b. United Kingdom port of quantities of steelwork required for the new station at Mayfair and the Germiston-Elandsfontein devia-

tion road bridge to carry main reef road over Pretoria lines at new Driefontein station. Tenders endorsed: "Tender No. 1027 for Bridgework," should be addressed to the Chief Stores Superintendent, Park Station Chambers, Rissik Street, Johannesburg, by whom they will be received up to noon on October 12.

Locomotives Required for Egypt

Tenders are invited by the Egyptian State Railways for the delivery of 10, 20, or 30 locomotives of the 4-4-0 type. The closing date for the receipt of the tenders is December 22.

Turntable Required in Argentina

The Argentine State Railways Administration is calling for tenders, to be presented in Buenos Aires by November 23, for the supply of a 25-metre railway turntable. Firms desirous of offering a turntable of United Kingdom manufacture can obtain further details from the Department of Overseas Trade.

Boiler Feed-Water Purifying Products Competition

The Argentine State Railways Administration has opened a competition for the selection of boiler feed-water purifying products suitable for use in its locomotives. Samples must be submitted in Buenos Aires not later than October 15. Tenders will be issued subsequently to the manufacturers of approved products. United Kingdom manufacturers can obtain further details from the Department of Overseas Trade.

The Indian Stores Department is calling for tenders, to be presented in Simla by October 1, for the supply of hard drawn high conductivity bare solid copper conductors. Firms desirous of offering conductors of United Kingdom manufacturer can obtain further details from the Department of Overseas Trade.

Forthcoming Events

Sept. 7-12.—World Power Conference, at Washington, U.S.A.
Sept. 9-16.—British Association, at Blackpool Annual Meeting.
Sept. 14-18.—Institute of Metals, at Paris Autumn Meeting.
Sept. 17-26.—"Model Engineer" Exhibition, at Royal Horticultural Hall, Vincent Square, London, S.W.1.
Sept. 19-23.—Commercial Motor Users' Association, at Brighton. National Road Transport Conference.
Sept. 26 (Sat.).—Permanent Way Institution (Manchester-Liverpool). Visit to Blackpool Corporation Gas Works.

Railway Share Market

The further reduction in the number of the unemployed and other indications of continuing trade recovery have influenced sentiment in the stock and share markets. Home railway stocks were prominent, largely owing to the excellent traffic figures which were well in excess of general expectations, the actual increase for the past week being as much as £229,000 for the main line railways. It is possible this good expansion may be due to the inclusion of end-monthly "sweepings," but a detailed analysis suggests that the railways are now benefiting much more fully from trade recovery.

L.N.E.R. second preference was very firm at 30 and there was speculative buying of the railway's preferred and deferred stocks following the news of the £94,000 rise in the past week's traffics. The L.M.S. records a traffic

gain of £61,000 for the past week (the first occasion for some time when it has not shown the largest weekly increase) and the ordinary stock was active around 28½, while the 1923 preference was firm at 77½. The Southern traffics attracted a good deal of attention as they show a rise of £41,000, the largest gain recorded for some time. The deferred stock responded with a rise to 23½ and the preferred was good at 92½. Great Western continued to receive a good deal of attention owing to the more favourable developments in the South Wales coal trade and the apparently attractive yield offered. In this case the weekly traffic rise proves to have been £33,000. Mersey ordinary stock has moved up further, but demand is probably not as large as might be deduced from the advance. The stock is held firmly and only a relatively moderate amount of buying probably in-

fluences the price sharply. London Transport "C" was again good on the more favourable dividend estimates which remain current regarding the dividend announcement, expected early next month. Among debentures L.M.S. 4 per cents. were half a point higher at 107½.

Argentine railway stocks have not benefited from the belief that higher wheat prices are likely to rule during the next twelve months. In fact rather lower prices ruled for B.A. Pacific at 7, Central Argentine at 10½, and B.A. Gt. Southern at 15½. B.A. Pacific 4½ per cent. consolidated debentures and Argentine Great Western 5 per cent. debentures both reacted fractionally to 45. Cordoba Central 4½ per cent debentures gained half a point to 33½. Leopoldina was good with a gain of nearly one point, largely owing to the hope that better traffics will continue. San Paulo were steady around the better price made recently. Most American railroad shares were better and Canadian Pacific also benefited from the more buoyant tone of New York markets.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1935-36	Week Ending	Traffics for Week			Aggregate Traffics to Date			Shares or Stock	Prices				
			Total this year	Inc. or Dec. compared with 1935	No. of Weeks	Totals		Increase or Decrease		Highest 1935	Lowest 1935	Sept. 9, 1936	Yield % (See Note)	
						This Year	Last Year							
Antofagasta (Chili) & Bolivia	834	6.9.36	£16,560	+ 4,450	36	£485,640	£440,120	+ 45,520	Ord. Stk.	23	1415½	161½	Nil	
Argentine North Eastern	753	5.9.36	10,641	+ 1,763	10	90,068	81,964	+ 8,104	A. Deb.	7	4	31½	Nil	
Argentine Transandine	—	—	—	—	—	—	—	—	6 p.c. Deb.	49½	30	47½	87½	
Bolivar	174	Aug., 1936	4,900	—	700	35	52,500	50,300	+ 2,206	Bonds	13	5	10	—
Brazil	—	—	—	—	—	—	—	—	Bonds	14	11	151½	31½	
Buenos Ayres & Pacific	2,806	5.9.36	74,309	+ 3,140	10	714,163	719,205	- 5,042	Ord. Stk.	101½	47½	71½	Nil	
Buenos Ayres Central	190	22.8.36	£128,600	+ \$11,400	8	£890,900	£894,000	+ 6,900	Mt. Deb.	21	10	14	Nil	
Buenos Ayres Gt. Southern	5,084	5.9.36	112,816	7,853	10	1,059,726	1,155,641	- 105,915	Ord. Stk.	27	13½	16	Nil	
Buenos Ayres Western	1,930	5.9.36	39,389	- 4,416	10	382,290	403,334	- 20,044	—	24	10	13½	Nil	
Central Argentine	3,700	5.9.36	145,397	+ 39,167	10	1,286,074	1,175,750	+ 110,324	—	177½	7	11½	Nil	
Do.	—	—	—	—	—	—	—	—	Dfd.	9	31½	7	Nil	
Cent. Uruguay of M. Video	273	29.8.36	10,014	+ 2,946	9	89,960	73,602	+ 16,358	Ord. Stk.	8½	3	4	Nil	
Do. Eastern Extn.	311	29.8.36	1,595	+ 220	9	15,399	12,441	+ 2,958	—	—	—	—	—	
Do. Northern Extn.	185	29.8.36	1,417	+ 357	9	13,293	10,404	+ 2,888	—	—	—	—	—	
Do. Western Extn.	211	29.8.36	1,091	+ 75	9	8,398	6,683	+ 1,715	—	—	—	—	—	
Cordoba Central	1,218	5.9.36	37,330	+ 3,040	10	363,850	336,510	+ 27,340	Ord. Inc.	4	1	11½	Nil	
Costa Rica	—	—	—	—	—	—	—	—	Stk.	35	30	33	61½	
Dorada	—	—	—	—	—	—	—	—	Ord. Inc.	35	30	33	61½	
Entre Rios	70	July, 1936	16,000	+ 2,400	31	95,300	80,400	+ 14,900	I Mt. Db.	1035½	102½	104½	5½	
Great Western of Brazil	1,082	5.9.36	5,900	+ 1,100	36	263,400	262,300	+ 1,100	Ord. Stk.	15	6½	7	Nil	
International of Cl. Amer.	794	July, 1936	£310,697	+ £17,787	31	£3,307,311	£2,960,676	+ £346,641	Ord. Sh.	1½	5½	10½	Nil	
Interoceano of Mexico	—	—	—	—	—	—	—	—	1st Pref. Stk.	1½	5½	10½	Nil	
La Guaira & Caracas	22½	Aug., 1936	4,945	+ 1,090	35	37,195	31,425	+ 5,770	Stk.	8½	8	51½	Nil	
Leopoldina	1,918	5.9.36	24,657	+ 5,297	36	665,614	607,219	+ 58,395	Ord. Stk.	1½	1½	1½	Nil	
Mexican	483	31.8.36	£838,410	+ £43,700	9	£2,199,300	£2,195,800	+ \$3,500	—	—	—	—	—	
Midland of Uruguay	319	July, 1936	7,734	+ 2,232	5	7,734	5,502	+ 2,232	—	—	—	—	—	
Nitrate	397	31.8.36	2,008	+ 5,516	35	86,121	101,134	- 15,013	Ord. Sh.	64½	42½	25½	Nil	
Paraguay Central	274	5.9.36	£2,874,000	+ £487,000	9	£25,462,000	£21,456,000	+ £4,006,000	Pr. Lt. Stk.	80½	60	72½	8½	
Peruvian Corporation	1,059	Aug., 1936	87,240	+ 12,556	9	171,561	148,497	+ 23,064	Pr. Pref.	105½	67	11	Nil	
Salvador	—	—	—	—	—	—	—	—	Pr. Lt. Db.	65	61	15	Nil	
Salvador	100	29.8.36	11,675	+ 21,500	9	93,174	£107,811	+ £14,637	Pr. Lt. Db.	80	35	60½	4½	
San Paulo	—	—	—	—	—	—	—	—	Ord. Stk.	11½	11½	11½	12½	
Talca	—	—	—	—	—	—	—	—	Ord. Sh.	120½	9½	11½	12½	
United of Havana	1,333	5.9.36	3,625	+ 1,205	9	6,150	4,945	+ 2,006	Ord. Stk.	31½	1	2½	Nil	
Uruguay Northern	73	July, 1936	18,368	+ 3,245	10	157,459	178,123	- 20,664	Deb. Stk.	41½	215½	41½	Nil	
Canadian National	23,615	31.8.36	1,131,072	+ 141,127	35	23,298,269	21,845,811	+ 1,452,458	—	—	—	—	—	
Canadian Northern	—	—	—	—	—	—	—	—	4 p.c. G.	785½	52½	101½	5½	
Grand Trunk	—	—	—	—	—	—	—	—	Ord. Stk.	93	101½	103½	Nil	
Canadian Pacific	17,237	31.8.36	922,200	+ 148,600	35	17,126,200	15,719,000	+ 1,407,200	—	—	—	—	—	
India,†	—	—	—	—	—	—	—	—	4 p.c. G.	1035½	93	101½	5½	
Assam Bengal	1,329	20.8.36	34,297	+ 5,218	20	473,350	455,033	+ 18,317	Ord. Stk.	92½	77½	85½	3½	
Bengali Light	202	10.8.36	2,760	+ 7	19	47,610	56,850	- 9,240	Ord. Sh.	105	77½	72½	6½	
Bengal & North Western	2,112	20.8.36	63,262	+ 8,935	20	1,075,763	1,007,138	+ 68,625	Ord. Stk.	301½	291	310	5½	
Bengal Dooars & Extension	161	20.8.36	3,709	+ 623	20	47,930	47,656	+ 274	—	127½	122	125½	5½	
Bengal-Nagpur	3,268	20.8.36	143,550	+ 1,299	20	2,351,806	2,486,532	- 134,746	—	105	100½	102½	3½	
Bombay, Baroda & Cl. India	3,072	31.8.36	193,500	+ 19,500	22	3,472,800	3,237,750	+ 235,050	—	115½	110	111½	5½	
Madras & Southern Mahratta	3,229	20.8.36	131,025	+ 1,791	20	2,229,103	2,165,771	+ 63,332	—	128½	1137½	112½	8	
Rohilkund & Kumaon	546	20.8.36	10,417	+ 1,554	20	213,684	192,674	+ 21,010	—	294	262	308½	5½	
South India	2,532	10.8.36	96,678	+ 7,085	19	1,467,342	1,486,016	- 28,674	—	115½	1041½	103½	5½	
Beira-Umtali	204	June, 1936	64,192	+ 8,141	39	577,342	576,265	+ 1,077	—	—	—	—	—	
Billao River & Cantabrian	15	July, 1936	1,677	+ 547	31	10,202	11,025	- 833	—	—	—	—	—	
Egyptian Delta	620	20.8.36	5,867	+ 104	20	82,105	76,206	+ 5,900	Prf. Sh.	2	15½	1½	5½	
Great Southern of Spain	104	22.8.36	479	+ 1,393	34	33,061	59,541	+ 26,480	Inc. Deb.	31½	2	31½	Nil	
Kenya & Uganda	1,625	July, 1936	184,229	+ 4,789	30	1,614,901	1,472,623	+ 142,278	—	—	—	—	—	
Manila	—	—	—	—	—	—	—	—	B. Deb.	48	36	43	8½	
Mashonaland	913	June, 1936	100,926	+ 1,113	39	916,081	1,047,960	- 131,879	1 Mg. Db.	1041½	100	103½	4½	
Midland of W. Australia	277	July, 1936	10,214	+ 794	4	10,214	11,008	- 794	Inc. Deb.	98½	93	95	4½	
Nigerian	—	—	—	—	—	—	—	—	—	—	—	—	—	
Rhodesia	—	—	—	—	—	—	—	—	61,613	—	—	—	—	
South African	13,263	15.8.36	611,463	+ 53,997	20	11,619,566	10,677,140	+ 942,426	—	—	—	—	—	
Victoria	—	—	—	—	—	—	—	—	—	—	—	—	—	
Zafra & Huelva	112	May, 1936	8,821	- 2,027	22	48,574	55,398	- 6,823	—	—	—	—	—	

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1½.

† Receipts are calculated @ Is. 6d. to the rupee. \$ ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.